

inaequaliterali, antice et postice rotundata: valvulis subtenuibus; natibus prominulis; epidermide transverse striata, tenebroso-viridi, redundater radiata: margarita cæruleo-alba et valde iridescente.

Hab.—Lake Nicaragua, Cent. Amer. Mr. W. M. Gabb.

ANODONTA GRANADENSIS.—Testa levi, elliptica, subinflata, *inaequaliter*, inæqualiterali, postice obtuse angulata, antice rotunda; valvulis subtenuibus; natibus prominulis; epidermide vel lutea vel viridi-radiata; margarita cæruleo-alba et valde iridescente.

Hab.—Lake Nicaragua, Cent. Amer. Col. E. Jewett.

An Examination of the REPTILIA and BATRACHIA obtained by the Orton Expedition to Equador and the Upper Amazon, with notes on other Species.

BY E. D. COPE.

The expedition for purposes of scientific exploration, to which the present paper relates, was undertaken during the autumn and winter of 1867—8, under the auspices of the Smithsonian Institution. Prof. James Orton, of Williams College, Massachusetts, directed the expedition, which was composed mainly of students of the same institution. This enterprise, particularly worthy of a popular institution of learning of the grade and position which an American College ought to occupy, has been attended with success in many departments of natural and physical sciences. In the present department, valuable in furnishing a reliable key to the history of the mode of creation and distribution of animal life, a considerable amount of material has been collected, which is reviewed summarily in the following pages.

The party divided, a portion ascending the Orinoco River to meet the other portion in Eastern Equador. The course of the latter was as follows, as I am informed by Prof. Orton:

They first touched the continent at Payta, Peru, and afterwards at Guayaquil; then proceeded inland over the Andes to Quito—collecting in the valley about three months; thence via Pafallacta (on the east slope of the eastern Cordillera) and Archiaona (the largest town in the Oriental part of Equador,) to Napo on the River Napo; thence by canoe down the Napo to the Marañon and Amazons.

They collected Reptiles chiefly from Guayaquil, Pallatanga (on the west slope of the western Cordillera south of Chimborazo); Ambato (in Valley of Quito); western slope of the volcano Antisana, 13000 ft. above sea (a small black frog); Archiaona—in the depths of the Napo forest (lizards chiefly); Santa Rosa on the Napo (lizards chiefly); Pebas, Peru, on the Marañon—2200 miles from the Atlantic (snakes chiefly,) and Tabatinga on the Brazilian frontier, (snakes chiefly.)

CROCODILIA.

CROCODILUS AMERICANUS Linn. *C. acutus* Cuv.

From Guayaquil.

TESTUDINATA.

TESTUDO ELEPHANTOPUS, Harlan.

From Guayaquil, identical with sp. from the Gallapagos Islands. This species presents the broad posterior vertebral shield of the American *T. tabulata* and *polypemus*.

CHELYDRA SERPENTINA Linn. Schweigger.

One sp. from Guayaquil, identical with nearctic specimens. This species furnishes a case of distribution unparalleled among reptiles, ranging as it does from the cold regions of Canada to the torrid region of Equador. Peters has already noticed Guayaquil as its most southern habitat, *via*. Monatsber., Berlin Ac. 1862, p. 627.

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SAURIA.

NYCTISAURA.

PHYLLODACTYLUS REISSII Peters, Monatsberichte, Preuss. Ac. Wiss. 1802, 626.
Several specimens of this handsome species from near Guayaquil.

GONIODACTYLUS CAUDISCUSTATUS Günther. Proc. Zool. Soc. Lond. 18 , p. .
From near Guayaquil.

GONIODACTYLUS FERRUGINEUS Cope. *Gonatodes ferr.* Cope, Proc. A. N. Sci. Phila. 1863, 102.

From the Napo and Maranon.

A Central American species of this genus is *G. fuscus* (*Stenodactylus* Hallowell. *Gymnodactylus scapulatus* Duméril. The *G. tenuis* of Hallowell is a *Eublepharis* Gray, from the Philippine Is.) *G. gillii* Cope, (l. c. 1863, 102) is *G. vittatus* Licht. von Martens Nomencl. Mus. Berlin. Was the latter ever properly published?

THECADACTYLUS RAPICAUDA Gray, Houttouny.

From the Napo and Maranon. Identical with specimens from Yucatan and St. Thomas, W. I.

PLEURODONTA.

IGUANA TUBERCULATA Laur.

One sp. (No. 6645) from Napo or Upper Maranon.

BASILISCUS MITRATUS Duméril. *Ptenosaura seemanni*, Gray.

Near Guayaquil.

HYPISIBATES AGAMOIDES Weigmann.

Napo and Maranon.

LIOCEPHALUS IRIDESCENS Günther, Proc. Zool. Soc. Lond. 1859, icon optima!

Specimens from the Plateau of the Andes, near Quito, No. 6710, and from near Guayaquil.

MICROLOPHUS PERUVIANUS, Girard.

Paita, Peru.

ANOLIS VIRIDIAENEUS Peters, Monatsberichte Preuss. Ac. Wiss. Berlin, 1863, 147,

From Napo or Upper Maranon.

ANOLIS ORTOXII Cope, sp. nov.

Of the same group as the last, that is, with smooth abdominal scales, and the median series of caudal scales not larger than the lateral; the tail is, however, only partially preserved, and as it is somewhat compressed the character of the vertebral scales may have been different in the lost portion.

Muzzle convex, wider than long, (measuring at anterior angle orbit,) covered with scales of different sizes. Occiput small, separated by several rows from superciliaries. Scales between the facial rugæ hexagonal, smooth, in four longitudinal rows, a little smaller than the plates of the rugæ which extend to the central row. Dorsal and lateral scales granular, nearly equal, and smaller than the rounded ventrals. Brachial scales a little larger, weakly keeled, anti-brachials much larger, keeled. Labials 8—8, the two posterior very small; loreal rows six. Frontal cavity distinct; superciliaries separated by one row scales. Sides of muzzle with longitudinal, smaller, weakly keeled scales. Auricular meatus two-fifths length eye fissure. Infralabials longitudinal smooth, in two or three rows. Supraorbital disc of some seven broad smooth plates, separated from superciliaries by a row of granular scales. Gular fan large.

When the limbs are extended the end of the metacarpal reaches end of muzzle, and the longest toe nearly reaches the orbit. The digital dilatations are well developed.

Top of head, nape, a rather narrow dorsal region and upper surfaces of limbs blackish coppery; sides and below golden, fan deep saffron yellow.

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	Lines.
Length from end of muzzle to vent.....	21.6
" " " " axilla.....	9.1
" " " " ear.....	5.5
Greatest width head	3.6
From Napo or Upper Marañon.	

This handsome lizard differs from *A. veridiaenus* Pet. in the shorter muzzle with larger plates and fewer large labials, and in the shorter limbs, as well as in coloration. I take pleasure in dedicating this species to Prof. Jas. Orton, of Williams College, to whom Science is indebted for this and other species of much interest included in the present essay.

DIPLOGLOSSUS MONOTROPIS Weigmann, Peters. *Camilia jamaicensis* Gray, Catal. Liz. Brit. Mus. 118.

This large scink is not an inhabitant of Jamaica, as given by Dr. Gray, but of Equador, as given by Prof. Peters in Mus. Berlin. I cannot think it right that the species should bear the name erroneously given, and accordingly adopt Weigmann's as above.

One sp. (No. 6694) from Guayaquil.

CENTROPYX PELVICEPS Cope, sp. nov.

This species bears much resemblance in structure and coloration to the *Monoplocus dorsalis* Günther, and would seem to be a mimetic representative in an allied genus. The presence of femoral pores in both sexes separates it generically, and the three additional series of abdominal plates is a marked specific feature.

Dorsal scales small, hexagonal, keeled, graduating into the smaller lateral; abdominals large, keeled and mucronate, in fourteen rows; preanals smooth, of equal size (except a marginal row of small ones) in three oblique series. Spurs large, appressed, two on each side. Caudal scales large, strongly keeled. Large scales on top of foot, tibia below, femur in front and below, fore arm above, humerus above and behind. Collar of a row of large mucronate scales, with three smaller series anterior. Middle gular region with scales little larger than the lateral. Nineteen pores on each femur.

The head slightly compressed, elevated, the superciliary ridges bounding a median concavity and continued back into a strong ridge which follows the margin of the occipital plates and encloses the plates of the parietal region in a deep basin. This margin is cordate behind. In younger specimens this elevation is not prominent, and is entirely absent from specimens of length of (head and body) two inches and less. Rostral shield nearly prolonged back to internasal; the latter broad as long, with straight lateral margins. Frontonasals in extensive contact. Frontal longer than broad, undivided, angulate before and behind. Frontoparietals elongate; interparietal wider than parietals, surrounded by the latter and occipitals, which form a regular disc, emarginate behind and extending nearly to the zygomatic angles. Nuchal scales granular. Nostril on naso-frenal suture. Two frenals, the anterior much the larger, the posterior not extending above the three or more small preoculars. Suboculars two or (divided) three. Superior labials six, inferior five. A symphyseal, a postmental, and on each side three large and two small infralabials, the anterior pair separated by a row of granules. Molar teeth tricuspid, the lateral cusps nearly as long as the median, but much narrower. Premaxillaries eight. Toes long, claws curved; outer toe markedly longer than inner.

Color in spirits bluish green, with a pale dorsal band from the nape to beyond the middle of the back; this is bounded on each side by a heavy black band of the same length, which sends in short branches nearly meeting similar ones from the other. In younger specimens the light dorsal band is brighter and extends from the tip of the muzzle; it is more frequently crossed by black bars. In these short black bars descend on the sides, and cross the upper surface of the tail. Yellowish olive below in all.

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	In.	Lin.
Total length of adult.....	14	6
Length to vent.....	4	7
" axilla.....	2	1
" to most posterior part of head shield.....	1	3
" to anterior margin orbit.....		7
Width at prefrontal angle.....		4.5
" at nostrils.....		2.5
" at angles mandibles.....		9.5
Length fore limb.....	1	10.5
" hand.....		8.75
" hind limb.....	3	7.1
" tibia.....	1	1.5
" foot.....		10

Specimens of this species (No. 6638) from the Napo or Upper Amazon of Equador.

AMEIVA PETERSII Cope, sp. nov.

Ventral plates in ten series; heel without horny tubercles. Two series of plates on under surface of tibia; frontal plate undivided, four supraorbitals. Inner toe longer than outer, both short. Brachial shields in three rows just continuous with the two series of antibrachials. Two pairs of parietal plates. Gular scales considerably larger on the middle of the posterior border; median scales of posterior fold larger than marginal. Preanal plates scale-like, small, two larger in the centre. Dorsal scales minute, keeled; interparietal plate wider than parietal, frontal narrowed behind; prefrontals well in contact; one large loreal. Postmental plate longer than wide, infralabials five continuous and three pairs posterior oblique. Numerous small plates behind the parietals; caudal plates keeled.

Color bright olive, with a narrow yellow band from below orbit to groin, banded above by a broad black band, which is marked by several white dots behind the scapular region, and is bounded above in front by a pale green line to orbit. A narrow dark band from below orbit to groin below the yellow. Sides blackish and pale spotted. The only specimen being young, the coloration of the adult is probably nearly uniform green.

	In.	Lin.		In.	Lin.
Total length.....	4	10.5	Length fore limb.....	8	6
Length head and body.....	1	9	" hind limb.....		17
" to edge parietal plates	6		" foot.....		9.5
" " orbit.....		2.5			

No. , from the Napo or Marañon.

The species is nearest *A. laeta* Cope, but is quite different in the preanal and parietal plates and gular scales. It is dedicated to Prof. Wilhelm Peters, of the Friedrich Wilhelm's University of Berlin, who has added much to Herpetology.

TEIUS TEGUEXIM Gray. *Tupinambis* Daud.

One sp. (6644) from Napo or Upper Amazon.

EUSPONDYLUS STRANGULATUS Cope, sp. nov.

This species is very distinct from others described, in the alternation of the dorsal transverse series of scales, the minuteness of those of the sides, nape and gular region, and in the constriction of the neck.

The general form is slender, the body not depressed, the tail of moderate length and considerably compressed. Neck much compressed, head elevated, flat above, muzzle short, compressed. Rostral truncate behind, internasal subquadrate, broad as long, frontonasals longer than broad. Frontal narrower, frontoparietals elongate; interparietal longer than broad, convex behind and projecting beyond parietals. Parietals one pair, in contact with supraorbitals, broader than long. Four well marked supraorbitals, without surrounding granules; five superciliary plates, posterior not smaller. Two loreals, the 1868.]

posterior below the other and continuous with the suborbital plates. The latter small, six, median pair smaller, all separated from orbit by granules. Temporal region with some flat plates, side of head granular, no auricular plates. Meatus auditorius large. Six upper, six lower labials; postgenial large; four large infralabials, two pairs in contact. Gular scales small, larger near rami and collar. Latter distinct, but not free, extending in front of axilla. Abdominal plates in eight rows, larger than dorsal scales, subquadrate, continuous by two rows with preanals; latter four, posterior pair much larger. Scales of tail smooth below, very weakly keeled above. Dorsal scales separated by a wide lateral granular region, one row of the former resolving itself into two of the latter.

The dorsal scales are in transverse series, which alternate with each other on the median line. They are weakly keeled, longer than broad, and rectangular; they grow smaller on the interscapular region, and disappear shortly in advance of it. Thirty rows between axilla and groin; 10—12 longitudinal.

Digits all well clawed, and with one row of scales below; longest finger .75 distance to groin when extended; longest toe to the gular fold in like manner. Antebrachium plated above and below, brachium above and behind. Femur plated in front only, tibia below only. Outer toe nearly as long as second, inner short.

Color (in spirits) above olivaceous; sides bluish, with a few very pale dots, hind face of femur similar; under surface head and body light yellow.

	In.	Lin.
Total length.....	7	
Length to vent.....	2	5.5
“ to collar.....		10.5
“ to end of interparietal plate.....		6
“ to eye fissure.....		2.5
“ of forelimb.....		10.4
“ of hind limb.....	1	3
“ “ foot.....		7.75
Width head at angle mandible.....		4.5
“ “ prefrontal bones.....		2.5
“ “ nostrils.....		1.5

I take the present opportunity of correcting a lapsus calami in a former review of the higher groups of the Reptilia Squamata, where I included the Eclepoididae under the head of families with the temporal fossa with bony roof. This roof is really dermal only, as in the Ameiva, as already mentioned by Peters.

MABUIA CEPEDI Gray, Cope, Proc. A. N. Sci. Phila. 1862, 186.

One sp. (6647) from Napo or Upper Marañon.

OPHIOGNOMON TRISANALE Cope, gen. et sp. nov.

Fam. Chalcididae. Nostril on the suture between the first labial and supranasal. Head shields above five, viz., two supranasals, one frontal and two occipitals. Limbs minute, four, without digits. Scales smooth, hexagonal, in annuli, those behind vent with a minute pore each. A short longitudinal fold behind axilla. No collar.

This genus is near Chalcis, but differs in the position of the nostril and character of the head shields. The latter above are much like those of some Mexican genera of Calamarian serpents, especially Sympholis Cope—name from *ὄφις*, serpent, and *τροπή*, a sign.

Char. specif. Muzzle obtuse, slightly projecting, rostral plate visible from above. Supranasals extensively in contact with each other and the first and second upper labials. Frontal large, hexagonal, posterior angle prolonged; parietals larger, obliquely hexagonal, truncate behind. Two superciliaries; four superior labials, posterior largest, truncate behind; temporals three on each side, anterior large. Two very small suborbitals, one minute preocular and a square loreal. Symphyseal narrow, inferior labials three, posterior lanceolate. Genial rhombic, large; infralabials three on each side, anterior pair

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extensively in contact, the posterior smaller and separated from temporals by four narrow plates, and from each other by four plates. The median pair of the latter are the larger and join the anterior pair of infralabials. A groove surrounds the throat behind the jaws, which is succeeded by five annuli of equal ovate scales. These are followed by a cross series of six more elongate, which precede a pair of large sternal plates extending between fore limbs. Abdominal scales different from the dorsal, truncate, not hexagonal. in six series. Dorsals in fourteen longitudinal, thirty-seven transverse rows between axilla and groin. Three elongate parallel anal plates; a series of seven small quadrate scales behind vent, each with a pore in the centre. Caudal scales below, angulate like dorsal.

Hind limbs style-like, minute, half as long as anal plates. Fore limbs as long as three anterior labials, consisting of humerus, forearm and carpus, but no digits; three terminal tubercles are probably metacarpal. Tail very long, subquadrate in section; the portion preserved, though nearly as long as the body, presents no diminution of diameter; the general form is probably snake-like, as in *Ophiosaurus*.

	In.	Lin.
Length head to rictus oris.....		2.25
“ “ to gular fold.....		3.75
“ “ to axilla.....		6.5
“ “ to groin.....	2	5
“ “ to vent.....	2	6.25
Width head at angle mandible.....		2

Color: below brown; sides with a brown blackish band, which is bounded above by a rather narrow yellow band which commences on the superciliary region. Dorsal region between the latter yellowish gray, bounded exteriorly by a distinct blackish line, and divided medially by an indistinct blackish line. The colors of the tail are similar. Head brownish, paler below.

This species presents several points of resemblance to the *Chalcides dobignyi* Dum. Bibr. The specific differences, apart from the generic, may be readily observed on comparing the descriptions. This is no doubt a sluggish animal, and moves much in the manner of a snake. It is the most snake-like of the Chalcididae, approaching somewhat the *Amphisbænia*.

One spec., No. 6637, from the Napo or Upper Marañon.

AMPHISBÆNIA.

AMPHISBÆNA FULIGINOSA Linn. *A. americana* Schreber, Gray.
Napo and Marañon.

OPHIDIA.

SCOLECOPHIDIA.

TYPHLOPS RETICULATUS Linn.
Napo and Marañon.

ASINEA.

TRACHYBOA GULARIS Peters, Monatsberichte Acad. Berlin, 18 , p. *Enygrus*, Jan.

The character of the rostral shield appears to separate this genus from *Enygrus*, as Peters observes; the cranium is quite similar to that of *Ungualia* Gray. From Guayaquil (No. 6683.)

BOA CONSTRICTOR Linn.

The loreal plate larger than the preocular; two rows scales between orbit and labials. No vertical or loreal brown band. Guayaquil.

XIPHOSOMA HORTULANUM Wagler. *Boa* Linn.
From Napo or Upper Amazon. (6679.)

NINIA ATRATA Cope. *Coluber atratus* Hallowell, *Streptophorus drozii* Dum. Bibr.
Elevated valley of Quito.

RHABDOSOMA MICRORHYNCHUM Cope, sp. nov.

Seventeen series of scales; supralabials seven, the first very small, the third and fourth entering the orbit. Prenasal larger, very nearly reaching lip. Prefrontals very small, equal postnasal, one-sixth the size of postfrontals. Latter longer than broad. Rostral contracted above by approach of prenasals. Loreal very long. No preocular, on one side two, on the other one postocular. Last upper labial longer than high. First pair of labials united; two pair only in contact with genials. Frontal subtriangular; occipitals elongate. Temporals 1—2. Total length 4 in. 7.5 lin.; tail 8 lin.

Coloration like that of a *Tantilla*. Above dark brown, beneath pale brown, with a faint line along the margins of the gastrosteges. Top of head blackish, brown behind; a partially complete yellow collar, which widens at the angle of the jaws. A deep brown band from eye to angle of mouth; upper labials yellow brown edged.

Tail slender acute.

No. 6693, from Guayaquil. Nearest the *R. badium* D. B.

TANTILLA MELANOCEPHALA. *Calomaria* Schl., *Homalocranium* D. B.

Two specimens, the longest measuring 17 inches. In both the postfrontals and labials are in contact, as in our other specimens, and as given in a synopsis of the genus (Proc. Acad. 1861, 74.) and not separated by postnasal and preocular in contact, as given in Jan's Iconographie.

From the valley of Quito.

OPHEOMORPHUS TYPHLUS Cope, Proc. A. N. Sc. 1862. *Coluber* et *Xenodon typhlus* auctorum.

From Marañon or Napo.

OPHEOMORPHUS ALTICOLUS Cope, spec. nov.

Scales in seventeen rows, all rather broad. General form typical, head distinct, plane. Rostral plate flat, very broad, advancing by its whole posterior convex margin on the internasals. Latter broader than long. Frontal with straight, nearly parallel sides, not encroaching on the superciliaries in front; front margin not quite equilateral. Occipitals a little narrowed and divaricate behind. Nasals narrow, postnasal longer than high; loreal very small, quadrate, on one side confluent with postnasal, and not encroaching on the single preocular. The latter is therefore wide; it just appears on the upper plane. One large postocular, the place of a small inferior is occupied by the angle of the large sixth upper labial.

Superior labials eight, seventh higher than long, fourth and fifth and scarcely the third entering orbit. Temporals $\frac{1}{2}$, the anterior only enlarged. Inferior labials ten, six in contact with the genials; the pairs of the latter about equal.

Total length 24 in. 6 lin.; length of tail 5 in. 2 lin.; of gape of mouth 9 lin.

Above green; lower surfaces with lips, and lower part of rostral plate, yellow, separated from nostril to rictus oris from the green by a black band. A black line commences about the length of the tail in advance of the vent, on the suture of the third and fourth rows of scales, and extends to the end of the tail on each side.

From the elevated valley of Quito. No.

Since its establishment by the author, in 1862, this genus has received several additions. The species known are as follows:

O. cobella L. *O. breviceps* Cope. *O. doliatus* Neuwied. *O. merremii* Neuwied. *O. alticolus* Cope. *O. typhlus* Linn. *O. viridis* (*Liophis viridis* Günther, Ann. Mag. N. II. 1862). *O. dorsalis* Peters, (*Liophis d.*, Monatsberichte Ac. Wiss. Preuss. 1863, 283).

LIOPHIS REGINÆ Linn., Wagler. *Coronella* Schl.

From Napo and Amazon.

LIOPHIS ALMADENSIS. *Natrix almada* Wagl. *Liophis wagleri* Jan.

The adult; the specimen figured by Wagler and Spix appears to be young. Napo and Marañon.

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LIOPHIS PYGMÆUS Cope, sp. nov.

This species is much the smallest of its genus; in size and appearance it is like a burrowing snake of the Calamarinæ, but its dentition, squamation, pores, and even style of coloration, are those of this genus. It is undoubtedly adult or nearly so.

Head slightly distinct, ovate, narrowed in front, muzzle slightly prominent. Rostral plate much broader than long, just visible from above. Internasals broader than long. Frontal large, elongate, longer than muzzle in advance of it, sides straight; superciliaries rather narrow. Occipitals elongate, including a notch behind, each bounded by two large temporals and $1\frac{1}{2}$ small scales. Postnasal lower than prenasal, loreal still lower, subquadrate encroaching on the preocular. Latter scarcely visible from above. Postoculars two, inferior half superior, both in contact with temporal. Upper temporal bounded by three scales, anterior larger, joining last labial. Superior labials seven, third and fourth entering orbit, sixth largest. Inferior labials eight, five in contact with genials. Latter, pairs equal.

Scales in seventeen rows, uniporous, those of the first larger.

Total length 7 in. 2 l.; tail 1 in. 1.5 lin.; that is 6.3 in the whole. Thus this portion is shorter than in the genus generally; it is quite stout. Gastrosteges 12.8, anal 1 | 1, urosteges 31.

Above deep olive, leaden on the sides and the ends of the scuta. Below uniform yellow. A black line from orbit to anterior lower angle of last labial. A broad black collar which encroaches on the occipitals, which is directed backwards and does not reach the gastrosteges. Continuous with the extremity of this, on the second, third and fourth rows of scales is a series of small black spots separated by intervals of from three to two rows; near the middle of the length these join and form a black band, which extends to the end of the tail. The median dorsal region becomes darker, and on the posterior fourth forms an indistinct band. Where the epidermis is lost and the skin is stretched the scales are white-edged. Top of head darker brown than sides. Lips not margined.

One specimen, 6,668, from Napo or neighboring pt. of Marañon.

DROMICUS LATERISTRIGA? *Liophis lateristriga* Berthold, Jan's Iconographie des Ophidiens.

The individuals in the collection differ from Jan's figure in a less distinct lateral stripe, and presence of occipital cross-band. It is not probably distinct. A description is, however, added:

Body cylindric, head flat, muzzle short. Scales in seventeen rows. Superior labials eight, fourth and fifth margining orbit, second to sixth inclusive, higher than long. Loreal higher than long; nasals nearly equal; one large, one small inferior preocular; the superior sometimes divided. Postoculars two, both in contact with the only elongate temporal. The latter is followed by two rhombic temporals, the first one above the seventh and eighth labials; and two scales on margin of occipital. Occipitals narrowed behind, as long as width between outer margins of superciliaries behind. Frontal, anterior and superciliary borders equal; prefrontals broader than long, rostral scarcely visible from above, much broader than high. Length of muzzle from opposite anterior margin eye, equal width frontal and one superciliary shield in front. Inferior labials eight, fifth largest, seventh next. Posterior genials equal anterior. Gastrosteges 155; anal 1 | 1; urosteges 69+; tail probably one-third or more lost.

Color above, a rich dark brown, the sides of the head darker; an irregular yellow band passes across the middle of the superior labials and passes round the nape on the fifth row scales behind the occipital plates and joins its fellow. A yellowish band passes along the outer margins of the two pairs of frontals, the superciliaries and the anterior third of the occipitals, interrupted at each suture. The dark of the upper surface extends on the gastrosteges, and is traversed for a considerable part of the length, and by a faint line forward, by a streak

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on the middle of each scale. A similar line, equally indistinct, traverses the scales of the fifth row, becoming more apparent on the tail. Color of lower surfaces deep orange red; lower labials and chin blackish.

Length of head and body 16 in. 9 lin.

This species is nearest the *D. brevirostris* Peters,* and *D. temporalis*† Cope. The two preorbitals, single large temporal, coloration and other points distinguish it. Its form is that of *Pliocercus* Cope, but belongs to *Dromicus* on account of its diacranterian dentition.

Two specimens (6702) from the elevated valley of Quito.

TACHYMENIS CANILATUS Cope, sp. nov.

This species differs from the known species in a more slender form; and in general appearance approaches the *Lygophis elegans* of Tschudi.

Scales in nineteen rows, elongate, thin, with single terminal pores. Superior labials eight, fourth and fifth bounding orbit, sixth larger than seventh. Inferior labials ten, fifth and sixth long and narrow. Posterior genials longest. Nasals large, distinct; loreal long as high, lower in front; preocular single, just reaching vertical; postoculars two. Temporals 1—1—2, the middle one largest. Parietals narrowed behind, whole plate one-fifth longer than frontal, common suture one-fifth shorter than same. Frontal narrower than each superciliary, spreading a little in front. Muzzle flat, internasals longer than broad, canthus rostralis strong. Rostral small, flat. Gastrosteges 199, anal 1—1, urosteges 98. Total length 18 in. 4 l.; of tail 5 in. 4; of gape 5 lin.

Color leaden gray on the sides, bounded above on the sides by a faint blackish streak; dorsal region brownish grey, with a double row of brown spots, when confluent covering five rows of scales. On the posterior half the body and tail they unite into a vertebral band, which is separated from the gray of the sides by a pale brown band. A dark band through frontal plate, split by a pale one; a pair of white dots on the parietals, as in *Tropidonotus* sp. Lips and belly below light yellow, the former brown-specked medially, black margined above posteriorly. A brown band outside of muzzle. Each gastrosteges with a row of brown dots its whole length.

This species was not obtained by the Orton expedition, but was sent from Guayaquil to the Smithsonian Institution in a collection made by Messrs. Destruger and Reeve.

CONIOPHANES DROMICIFORMIS Cope, Proc. Acad. 1866, 128. *Tachymenis dromiciformis* Peters, Monatsberichte Preuss. Ac. 1863, 273.

In four specimens of this species I find no scale-pores, and but one preocular. Prof. Peters describes scale-pores as present in his types, but I failed to see them on examination of the same specimens, which he permitted me to make. This character alone distinguishes this genus from *Tachymenis*, though I ascribed the same importance, on a former occasion, to a supposed difference in the number of preocular plates. That this is of little value in this case, I can now agree with Peters in believing.

From Guayaquil. No. 6689.

RHADINÆA CHRYSOSTOMA Cope, sp. nov.

This species agrees with those of *Rhadinæa* in technical characters only. Its proportions are those of *Opheomorphus*, from which it differs in the entirely equal teeth. It might be referred to *Hypsirhynchus*, but in that genus there is a single scale-pore, in the present they are wanting. The vertebrae are not furnished with hypapophyses on the posterior third of the length, but are keeled below.

Head elongate oval, quite distinct; muzzle truncate when viewed from above or in profile, not projecting. Rostral plate scarcely visible from above; prenasal higher than postnasal; loreal high as long, encroaching very little on preocular, which latter does not reach frontal. Oculars 1—2, temporals 1—2.

* Monatsberichte Preuss. Academie Wiss. 1863, 280.

† Proc. A. N. Sci. 1860, 307.

Anterior touching both postoculars. Labials 8—10; the upper with fourth and fifth entering orbit, chiefly the fourth, which is longer than fifth. All longer than high, the seventh largest, longer above than on labial border. Genials long, anterior longer than posterior. Frontal elongate with nearly parallel and slightly concave sides; occipitals moderate, narrowed behind. Scales in seventeen rows, all of nearly equal size and rather broad.

Total length 8 in. 4 lin.; of tail 1 in. 6 l.; of gape 5.35 lines. The tail is thus as short as in *Opheomorphus*. Eyes rather small. Internasals about as wide as long. Gastrosteiges 157; anals 1 | 1; urosteges 57.

Upper surface of head and body dark-brown, which is bordered, except just behind the head, by a series of small round brown spots on each side, which become a band on the posterior fourth. Below this and ground of belly yellow, which is prolonged as a band along upper labials to rostral, leaving a black labial margin. Belly with black cross-bars and halves, more sparse posteriorly, confluent anteriorly on the fourth of the length; this is here and there spotted with yellow.

From the Napo or Maranon. No. 6665. This single specimen is probably not fully grown.

MASTICOPHIS PULCHRICEPS Cope, sp. nov.

This species is described from a specimen twenty-one inches long, and not probably adult. The coloration of the dorsal region has considerable resemblance to that of the young of *M. rappa* Gthr.

Rather slender, the head quite distinct, rather short, somewhat flattened and with broad muzzle. Tail 3.6 times in the total length. Superior labials eight, the anterior short, the two posterior elongate, the third, fourth and fifth in contact with the eye, the fifth and sixth elevated. Orbitals one—two; the loreal higher than long; temporals 2 | 2 on each side, the upper anterior the smallest. Internasals broader than long, rostral prominent, scarcely visible from above. Frontal little concave laterally, least width little less than .5 length and equal greatest width the superciliaries. Greatest length occipitals exceeds same of frontal; they are truncate behind, and with straight outer margins. Inferior labials ten; pregenials much shorter than postgenials.

Scales of body smooth, in seventeen rows, second as large as the others. Gastrosteiges 170, anal 1 | 1, urosteges 100.

Ground color above and below dark-blue gray, which is largely obscured in the following manner: A series of quadrate black spots extends from nape to near end of tail, alternating with a lateral series of the same, without line of demarkation between. Each spot is separated from the next by a cross-bar of ground color, in which all the scales are white-edged. These bars are prolonged on the gastrosteiges, and their extremities fall into a line of yellow spots on a blackish band, which extend on each side to vent. The cross-bars are only one scale wide. A black nuchal crescent, which extends as a band on each side through orbit round end of muzzle. This sends a bar to the edge of the lip at the orbit and angle of mouth, which connect on the lip. Gular region black with numerous yellow spots. Top of head dark brown, with numerous paler brown marks within the margin of each scale.

One sp. (6704) from the plateau valley of Quito.

MASTICOPHIS BRUNNEUS. *Herpetodryas brunneus* Günther, Catal. 116. *Dryomobius* Cope, Pr. A. N. Sci. 1860.

Two sp. (6705), one from Guayaquil and one from valley plateau of Quito. Both belong to a variety with an indistinct series of small dark spots on each side of the vertebral line, forming an incomplete longitudinal streak.

HERPETODRYAS CARINATUS Boie, Linn.

Valley of Quito; Guayaquil; Napo and Maranon, 6706, 6682, 6661, the last all of the var. *fuscus*.

SPILOTES PICEUS Cope, sp. nov.

This species exhibits the isodont dentition and entire anal plate of *Spilotes*, 1868.]

with the cylindric body and elongate tail of *Bascanium*. The relative length of tail, within the proportions included by the genera in question, is, however, a more variable character than the integrity of the anal plate as a generic feature in our estimation. I therefore refer it to the *Spilotes* series. The divided anal plate is also characteristic of *Masticophis*, (Peters describes a Mexican species in which he says it is variable); this species is, however, more massive than these, and generally proportioned as the *Bascanium* *constrictor*.

Scales in fifteen rows, broad, subequal, all smooth. Tail 3.6 times into the total length. Head rather distinct, ovate, muzzle not prolonged. Anterior margin four-fifths total length; lateral margins slightly concave. Prefrontals broader than long. Occipitals concavely, continuously truncate behind; temporals 2 | 2, entirely in contact with two last labials. Only one small plate besides bounding occipital. Superior labials eight, fourth and fifth bounding orbit; sixth subtriangular, in contact with lower postocular. Postnasal higher than prenasal, loreal higher than long, one pre- two short postoculars. Inferior labials nine; postgenials considerably longer than the pregenials. The rostral plate is rather narrowed and with concave sides; it is barely visible from above.

Above and gastrosteges to one-fourth their length on each side, deep black. Lower surfaces, with upper labial shields, yellow; black margin dividing two last labials horizontally; no dark margins to labials.

Total length 51 in. 8 lin.; of tail 13 in. 8 l. Gastrosteges 169; anal 1; urosteges 92.

This fine species is from the Napo or Upper Maranon. No. 6660.

To this genus must be referred the *Geoptys collaris* and *G. flaviventris* Steindachner (Sitzungsber. Wien, 1867, 271), while the name *Geoptys* applied to *Coryphodon pantherinus* and *C. constrictor* of the Erp. Générale must become a synonym of *Bascanium*, Baird and Girard. *G. collaris* is *Sp. melanurus*, from Mexico, while the *G. flaviventris* is too near *Sp. corais*.

THRASOPS CUPREUS Cope, sp. nov.

A slender, cylindric species, with an unusually short broad head.

Scales in fifteen longitudinal rows, the three median a little larger than the others and equal, the median five, keeled, the keels invisible or nearly so, when the epidermis is lost. Head flat above, muzzle contracted and short. Rostral plate little visible from above, much broader than high, internasals subtriangular, behind broad as long. Prefrontal on one side descending to labials, on the other, all below the canthus rostralis cut off as a large loreal. Frontal not longer than superciliaries, with concave sides and a right angle behind. Occipitals well developed, broad, broadly truncate behind, bounded by five temporals. The anterior of these is much the largest and in contact with three labials and the postoculars; behind it a second large plate borders the last labial only. Superior labials eight, none elevated, fourth and fifth margining orbit; oculars one, two, the inferior posterior minute. The long narrow nasal is acuminate posteriorly, and borders the first and half the second labial, and the internasal plate exactly.

The number (15) of rows of scales is retained on the neck. Total length 20.5 in.; of tail 8 in.; of gape of mouth, 5.5 lines. Gastrosteges 152, anal divided (generic char.); urosteges 136.

Color above metallic copper color, with the shades at the bases of the scales, and cross-shades of the same on the anterior half of the body. A narrow dark streak from nasal plate along upper edges of labials; the latter and chin yellowish white, below brown copper colored, with darker dashes. When the epidermis is lost, which very readily occurs, the derm appears of a coppery silver color.

From the Napo and Maranon. No. 6666.

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THRASOPS OCCIDENTALIS, *Ahetulla occidentalis* Günther, Proc. Zool. Soc. Lond. 1859, 412.

From Guayaquil, from Messrs. Detruger and Reeve.

OXYBELIS ACUMINATUS, Wied.

Guayaquil, 6687.

OLISTHENES CORONATUS, *Scytale coronatum*, Dum. Bibr. Gthr.

OXYRHOPUS SEBÆ, Dum. Bibr. vii, 1056.

From the valley of Quito. The stomach contained a *Liocephalus*.

LEPTOGNATHUS BUCEPHALUS Cope, *Dipsas* Schleg. *Dipsadomorus indicus* Dum. Bibr. *Dipsadomorus bucephalus* Jan. *Leptognathus indicus* Günther. Tab. Seba, xliii, 4-5.

This species is no doubt the type of Laurenti's genus *Dipsas*, as I have pointed out, (Proc. Acad. 1860) but by the rule of exclusion, as *Leptognathus* was first taken from it, the remaining species, to which Duméril and Bibron applied the name *Triglyphodon*, should retain the original name.

Fine specimen; Napo or Marañon.

As the species in the Academy are not embraced in the *Erpetologie Générale* and other works, I give a synopsis of those known to me, six of them not described in any general work. The species not embraced in the Equador collections are described at the end of the catalogue. I have been aided in this by Jan's *Elenco serpentium*.

Group I. Dorsal scales smooth, a larger vertebral series; anterior genials very short; two pairs of inferior labials in contact in advance of the genials. (*Dipsadomorus* D. B. Jan.)

Scales in 13 rows; a large preocular; above and below liver brown, with broad lighter cross bars, which terminate in a bright yellow spot on the edges of the gastrosteges; six genials, with lateral plates behind BUCEPHALA.

Scales in fifteen rows; no preocular; four genials; dark brown, with darker cross-bars; below yellow with lateral dark spots. VARIEGATA.

Group II. Scales smooth, vertebral series larger; anterior genials small, preceded by one pair of labials;

α. Loreal plate not reaching the orbit.

Two preoculars, two postoculars, scales in thirteen rows; vertebral plates reaching occipital; nine upper labials; chestnut brown, with black yellow-edged discs on the sides which become confluent into broad cross rings anteriorly, separated by yellow; head black with yellow collar and cross band on muzzle. CATESBYI.

αα. Loreal plate entering the orbit.

β. Two postoculars.

Thirteen series of scales, (ten) eleven superior labials, one preocular, twelve inferiors, six genials, without laterals, vertebrals not reaching occipitals; light, a series of broad rounded, brown light edged dorsal spots, just reaching gastrosteges; belly unspotted PAVONINA.

Fifteen series scales, nine superior labials, no preoculars, eleven inferiors, four genials, no lateral genials, vertebrals not reaching occipitals; much compressed; yellow with broad brown entire annuli; nape and temples and spots on muzzle yellow. ARTICULATA.

Fifteen series scales, seven superior, nine inferior labials; two, one, or no preocular; six genials, with laterals, vertebrals broader, body shorter; brown, with continuous or alternate narrow, dark brown yellow-edged cross bars; belly with few lateral spots, top of head with five dark light-edged ocelli. MIKANII.

Fifteen series scales, vertebral little larger; seven superior, eleven inferior labials; six genials, no laterals; less compressed; yellow, black specked, with broad black equal annuli, not quite complete, on the belly, and dorsal black spot between; head black, varied above, belly much black spotted. OREAS.

ββ. Three or four postoculars.

Vertebral series larger, no preoculars; ten superior and inferior labials, six genials with laterals; fifteen rows scales; light brown with a series of blackish cross bands, very broad anteriorly, much narrower and more numerous on most of the length; a series of brown spots below. INÆQUIFASCIATA.

Group III. Scales smooth, vertebral series larger; anterior genials forming a long pair as in other serpents, preceded by one pair labials. (*Petalognathus* D. B.)

Fifteen rows scales, dorsal series not reaching occipitals; no preoculars, two postoculars; four genials, no laterals; thickly brown dusted, with brown yellow edged dorsal cross bars which are or are not continuous with a lateral series which is continued on a portion of the gastrosteges; below yellow. NEBULATA.

Group IV. Scales smooth, dorsal series not larger; anterior genials elongate, colubriiform, preceded by one pair of labials.

Thirteen rows of scales, no pre-, two postoculars; seven superior, eight inferior labials; three pairs genials, without laterals; black with yellow rings continuous on the belly but not on the anterior parts above; yellow scales black edged; temple and nape yellow. ANTHRACOPS.

Group V. Scales equal, smooth; genials short, broad, preceded by two pairs of labials.

Fifteen rows scales, one preocular and a subloral, three postoculars, nine superior, eleven inferior labials; slender, compressed; black with narrow yellow annuli; chin all black, a yellow collar. BREVIFACIES.

Group VI. Scales equal, smooth; genials short, broad, preceded by one pair inferior labials.

Form little compressed, scales in fifteen rows; eleven superior, eight inferior labials; no preoculars, two postoculars; four genials without laterals; yellow brown, with three rows black, yellow edged subquadrate spots, which unite in front and become also longer; head spotted, small spots on sides of belly. TURGIDA.

Group VII. Scales equal, several dorsal series keeled; first pair of genial plates short, preceded by one pair of labials only. (*Tropidodipsas* Gthr.)

Head more elongate, scales in seventeen rows; two anterior, two posterior oculars; three pairs genials, seven upper

- labials; black with nearly equal yellow annuli; not complete on belly..... FASCIATA.
- Head short, broad; scales in seventeen rows, the three median only keeled; one preocular, loreal reaching orbit, two postoculars, three pairs genials; six superior, nine inferior labials; black with narrow yellow rings, yellow scales, black tipped..... SARTORII.

The seven groups of this genus do not represent genera, but rather sections, for the following reasons. The vertebral series of dorsal scales is so reduced in *L. oreas* Cope, as to constitute it a link between the two types in this respect. The keels are so weak in *L. sartorii* Cope, and the allied *L. anthracops* Cope being smooth, this character appears to have no more than specific value. The elongate pregenials, appear to constitute a strong distinction, but in one of our numerous *L. nebula* they are divided as in other species. Lastly, the peculiarity of the junction of two inferior labials is less to be relied on, in view of the fact that in one of our *L. bucephala* there is one on one side and two on the other in front of the genials.

LEPTOGNATHUS CATESBYI Günther, *Coluber* Weigel, *Stremmatognathus* D. B.
Apparently abundant on the Napo and Upper Maranon.

LEPTOGNATHUS OREAS Cope, sp. nov.

Body less compressed posteriorly than anteriorly. Frontal plate broader than long, very obtuse behind. Occipitals 1.75 times longer, narrowed and divergent behind. Temporals one large anterior higher than long, in contact with both postoculars; two broad ones, lower joining last labial, then a row of four. Four anterior labials not narrowed, third, fourth and fifth entering the orbit; the three last longer than high.

Dorsal band wider anteriorly, approaching on the sides; behind they are not all continuous, but alternate on the sides, then also the light intervals are much obscured, no black collar. Chin and throat yellow. An irregular black yellow edged band on each side of head from behind occipitals to middle of superciliaries; other head plates with similar black margins. Upper labials yellowish, with a black line from loreal plate, one from orbit, and a broad one over last labial, including two last lower labials. Belly largely obscured with black.

Gastrosteges 180, anal 1; urosteges 90.

Total length 26 in.; of tail 7 in.; of gape of mouth 8 lines.

From the elevated valley of Quito. (No. 6707.)

LEPTOGNATHUS NEBULATA Günther, Jan. *Coluber* Linn. *Dipsas* Schleg. *Petalognathus* Dum. Bibr.

No. 6708 from the valley of Quito.

This species is the most extensively distributed of the genus. It ranges from the Tierra Caliente of Vera Cruz (Sumichrast) to Nicaragua (Caldwell) to Caraccas (Ashmead) and Dutch Guiana (Hering); according to Günther from Pernambuco.

HIMANTODES CENCHOA L., D. and B.

Napo and Maranon. No. 6670.

LEPTODIRA ANNULATA Linn., Fitz.

Napo and Maranon, and Guayaquil.

PROTEROGLYPHA.

PELAMIS BICOLOR.

From Guayaquil and Panama, apparently not rare.

ELAPS LEMNISCATUS Linn.

Guayaquil, (6685.)

1868.]

ELAPS MIPARTITUS Dum. Bibr.

Four specimens from Guayaquil, and one from the valley of Quito.

ELAPS IMPERATOR Cope, sp. nov.

This is a species of the *E. corallinus* group, and is nearest to the series B. II. a. γ . a. of Günther's synopsis of individuals of this genus;* or to the *E. ornatisimus* of Jan. It differs from the latter and from all others, in that the black bands are wider than the red and cease at the third row of scales, not extending on the first two, or on the gastroteges. The two rows are margined with black on a yellow ground. Black bands 7.5, red ones 5 scales wide; scales in the latter, of the first row, narrowly, of the two following broadly tipped with black; the remaining dorsal series entirely black or with a faint basal shade of red. Yellow margins on half scales alternating. The red bands cross the belly on two and a half gastroteges. Top of head and nape black, except outer half of internasal and prefrontal plates, which with the labials are yellow. Labials black edged, not in contact with temporals, which are yellow edged at bases. Lower lip, rostral plate, chin and belly unspotted, yellow. Two postoculars, Gastroteges 225, anal 1 | 1: urosteges 37.

Total length 2 ft. 3 in. 4 lin.; of tail 2 in. 7 l.

From the Napo and Marañon; one specimen.

It is difficult to imagine a more elegantly colored species of this beautiful, but venomous genus. Dr. Günther has shown the inconstancy of colors in some species of the genus. Within certain limits the species are very constant, as I have had occasion to observe in numerous specimens of *E. lemniscatus*, *E. elegans*, *E. mipartitus*, *E. nigrocinctus*, *E. enryxanthus*, *E. fulvius*, etc.

SOLENOGLYPHA.

TELEURASPIS NITIDA Cope. *Lachesis nitida* Günther, Proc. Zool. Lond., 1859.

From Guayaquil.

TRIGONOCEPHALUS BRASILIENSIS. *Bothrops jararaca* Wagl. *Craspedocephalus* Gray.

Three specimens from Napo and Upper Amazon; the smallest with fifteen urosteges behind the vent, undivided.

TRIGONOCEPHALUS XANTHOGRAMMUS Cope, sp. nov.

Form rather elongate; head elongate, muzzle short. Scales of body in twenty-seven longitudinal series, not strongly keeled, the dorsal narrow, those of the first row ovate, longer than broad. Scales of the whole top of the head small, smooth, nine or ten rows between the large superciliary shields. Four elongate plates in a row on top of the end of the muzzle, which are bounded behind by four much smaller ovate ones. Superior labials seven, the second bounding the pit anteriorly; the last five large and of nearly equal size, inferior labials eleven, the two anterior broadly in contact in front of genials. Two preoculars are loral, two nasals; rostral elevated. Gastroteges 196, urosteges 54.

Color above very dark olive, with a zigzag yellow line on each side from the head to the origin of the tail, the apices of the open Vs usually meeting on the vertebral line, enclosing dorsal rhombic spaces and lateral triangles. The bases of the triangles embrace seven or eight transverse series of scales. Gastroteges black, paler medially, with yellow irregular spots at their extremities. Gular region, chin, and superior labials bright yellow; a bright golden band round the end of the muzzle, involving the greater part of the superciliary plates, passes to the nape, and is bounded below by a black band from eye to angle of mouth; top of head black, with a pair of undulating yellow bands from the nape which meet on the vertex forming a V.

* Ann. Magaz. N. Hist., 1859, 171.

	Inches.
Total length.....	60·7
Length of rictus oris	1·75
Length of tail.....	7·5
Width between outer margins superciliary plates.....	0·7

From Pallatanga, Equador. Two specimens.

BATRACHIA.

ANURA.

ARCIFERA.

CINCLIDIUM GRANULATUM Cope, Journ. Acad. Nat. Sci., 1867, 202.

Length body and hind limb together 8·5 inches. One specimen. No. 6659. From the Napo or Upper Amazon.

HYLA MARMORATA Daudin, Dum. Bibr.

This species is quite distinct from that described and figured under this name by Burmeister.* The latter being without name may be called *H. senicula*.

I append a description of the fresh coloration of this species, which does not appear to have been recorded.

Ground color above gray, with two large blackish blotches which extend backwards on the sides, one from the iliac, and one at the axillar regions. These are confluent on the middle line of the back, leaving only the scapular regions and insignificant spots of the ground, which is more or less replaced by bay. The last color forms a V-shaped figure with broad black border, whose limbs reach the orbits and enclose a pink gray space which is bounded in front by a black interorbital cross-band. Top of muzzle light bay. Gular region pale, with dark gray speckles. Belly and femora, except a narrow band above, with basal part of humerus, yellow black spotted; the spots smaller and thicker on the belly. Upper surfaces of limbs dark gray with rufous shades, cross-banded with darker. End of humerus and femur, fore arm and band with tibia and whole foot black below; the distal halves of the webs yellow. Dermal margin of ulna and tibia white.

From the Rio Napo or Upper Amazon below its mouth. Eleven specimens. This species is strikingly different from others of this genus, in the great extent of its webs, and the singular coloration. It appears to be abundant in the region named. No. 6649.

HYLA LEUCOPHYLLATA Beireis. *H. frontalis* Daud.

A variety in which the brown dorsal patch does not bifurcate to the lateral band, and the muzzle is rather more elongate.

Napo and Upper Maranou. No. 6650.

HYLELLA CARNEA Cope, sp. nov.

This is a small species with a broad rounded head, and slender body and limbs. The canthus rostralis is moderately distinct, and the tympanum indistinct and small, and surmounted by a fold. Eyes large and prominent, diameter ·25 greater than length of muzzle in advance of them. Nostrils terminal, end of muzzle vertical. Tongue round, ·25 free behind. Ostia pharyngea equal inner nares. Fingers ·33 webbed, and with dermal margins; dilatations of moderate size. Skin of body above smooth.

The exterior coloration does not appear on the femur, which is unicolor behind, and only as a faint line on humerus. This pigment is light rose yellow; three narrow bands across tibia, two across fore arm. A broad blood-red band between the eyes, each extremity sending a blood-red band on each side the back to the vent, with a connecting spot of the same on the coccyx. A deep

* In Erläut. z. Naturg. Braziiliens.

red band from scapular region to end of muzzle; and line below the eye. Below uniform whitish.

	Lin.		Lin.
Length head and body.....	9	Width head.....	3
“ hind limb.....	14	Length gape.....	2
“ hind foot.....	6		

From the Napo or Upper Maranon, (6728.)

The third species of this little known genus.

PITHECOPUS TOMOPTERNUS Cope, sp. nov.

This genus with *Agalychnis* Cope, and *Phyllomedusa*, embrace the most brilliantly colored of tropical Batrachians. Their characters were first pointed out by the writer in *Journal Ac. Nat. Sci. Phila.* 1866. The species of *Pithecopus* Cope, are now four, two having been added by the William's College Expedition; they may be distinguished as follows:

I. Parotoid stratum of crypts not visible externally; no external surface pigment on humerus.

α. A yellow band round upper lip to middle of sides; pigment of fore arm extending on two outer fingers; dilatations small; second toe shorter than inner.

No dermal processes on heel; lower eyelid transparent; no vomerine teeth; concealed portions of limbs and sides with vertical brown bands; small.....*P. AZUREUS* Cope.

No dermal processes on heel; lower eyelid reticulate; vomerine teeth; concealed surfaces of limbs with vertical brown bands; fewer of the same on sides, and brown spots behind axilla; small...*P. HYPOCHONDRIALIS* Daudin.

αα. No yellow band on upper or lower lip or side; external pigment not extending on outer fingers; dilatations large, second toe longer than inner.

Lower eyelid reticulate; vomerine teeth; two angular dermal heel processes, together having a truncate posterior outline; concealed surfaces brilliant yellow, with broad vertical purple bars; size larger—

P. TOMOPTERNUS Cope.

II. Parotoid stratum of crypts distinct, extending from orbit to sacrum; humerus covered with the external pigment.

α. No yellow band on upper lip, an imperfect one on side; outer fingers and toes covered with the external pigment; dilatations large, second toe shorter than inner.

No dermal processes; lower eyelid not reticulate; vomerine teeth present; green, upper arm with a yellow band; concealed surfaces of limbs with purple clouds; below purplish; large.....*P. TARSIVS* Cope.

P. tomopternus has much the coloration of *Agalychnis* sp., and the whole form a series leading from *Hyla* to *Phyllomedusa*.* The *P. tarsivus* ap-

* One species of this genus has been long known, but has been confounded by modern authors with the longest known species of the genus *Pithecopus*. A second species is here added.

Inner toes equal; dilatations large; sides little, limbs unspotted; skin with stellate bony deposits..... scleroderma.
Second toe shorter than first; dilatations small; sides, throat and limbs largely yellow-spotted; skin smooth..... bicolor.

P. SCLERODERMA sp. nov.

One of the largest of the *Hylidæ*, measuring from end of muzzle to vent 4 in. 1.5 lines, same to posterior border tympanum 1 in. 3.4 l.; between parotoids and scapula 1 in. 6.5 l. Axilla to carpus 1 in. 11.6 l. Carpus to end of third finger 1 in. 2.5 l. Femur and tibia 3 in. 0.6 l.; tarsus 1 in. 3 l.; tarsus to end fourth toe 1 in. 4.6 l.

The general form is much that of *P. bicolor*, but the toes are longer and provided with larger dilatations; the under face of the tarsus, and the skin generally, are devoid of dermal tubercles. The integument of the whole upper surface of the head and body is studded with aggregations of osseous radii, which surround, more or less, numerous

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proaches the last named genus most closely, and equals them in size. Of the *P. azureus* I have seen three specimens from Brazil, two from the upper Paraguay, and one from Pernambuco; of the *P. hypochondrialis* one specimen from Dutch Guiana.

The *P. to m o p t e r n u s* is of elongate form; width of head 3·3 times from end of muzzle to end coccyx. Loreal region elevated, plane, canthus rostralis contracted, muzzle not quite vertical in profile. Tympanum one-third the large eye. Vomerine in two small fascicles opposite the anterior part of inner nares, as far apart as each is from the choana. Inner nares very large, rather larger than ostia of eustachian tube. The elbow reaches end of muzzle, the heel to front of orbit. A dermal fold on lower arm, strong on elbow; a weak one on tarsus, terminating above in two heel processes, one projecting inwards and one outwards. All the fingers and toes entirely free, thumb opposable, fourth finger considerably longer than second. Longest toe the fourth, then 5, 3, 2, 1. Palm and sole with strong tubercles.

The colors are very brilliant; above green, below with hands and feet yellow; outer fingers and toes bound with purple, like the concealed surfaces. One specimen has an exceedingly narrow yellow margin to the upper lip. No brown margin inside lower lip.

	Lines.
Total length head and body.....	23·
Length to posterior margin tympanum (axial).....	6·1
“ fore limb.....	15·6
“ band.....	5·6
“ hind limb from groin.....	32·6
“ tarsus.....	7·75
“ metatarsus and longest toe.....	7·

Two specimens of this tree-frog are in the collection from the Rio Napo, or Upper Amazon, below the mouth of the former. They are males and have the corneous thumb shield of the breeding season. No. 6651, Mus. Smiths.

PITHECOPUS TARSIVS Cope, sp. nov.

Form slender; width of head at jaws, enters from end nose to vent, 3·5 times. Loreal region elevated, with the canthus concave; upper lip projecting beyond muzzle. Diameter of eye three times tympanum. Tongue elongate, largely free and openly marginate behind, narrowed in front. Vomerine teeth in two transverse fasciculi, which are equi-distant from each other and the anterior margin of the large internal nares. Ostia large and less than nares. Skin everywhere granular, perhaps more properly glandular, those of the sides largest. Arcolæ very large and flat on the pectoral region; a series of larger glandulous areolæ on each thigh below. No distinct dermal margin on forearm or tarsus. Digital dilatations of hand largest, larger than the tympanic disc; that of the thumb smaller. Elbow to opposite nares; heel to front of orbit. Second toe much shorter than first, third less than fifth.

Color everywhere green, shaded with purple on gular and thoracic regions; also along sides and on under surfaces of thumbs. Femur green, except below, two external digits of the same color. An irregular yellow band on side from

central points. These do not penetrate through the derm, which is thick, and entirely free from the skeleton in every part. Muzzle elevated, loreal region straight, canthus rostralis strong, concave. Male with vocal vesicle. Tympanum one-half of orbit; inferior palpebra medially transparent, dermoid at the circumference. Vomerine fasciculi oblique between nares as near the latter as each other. Minute areolations on posterior gular region. Tongue small. Elbow extends to end of muzzle; hand and longest finger equal forearm. Heel to orbit; sole and longest toe exceeding tarsus; cuneiform tubercle minute; base of thumb broad, with a flattened tubercle.

Blue-green with faint light margin to posterior parts of upper and lower lips, and one series of very narrow longitudinal lateral spots. Limbs blue above, except the pale brown spotted upper arm; antibrachium and tarsus yellow margined; femora uniform pale blue behind. Below uniform pale.

Habitat.—Surinam, *Hering*, Mus. Academy Nat. Sciences. Burmeister suspects the species of the Amazon to be that found in Surinam, and different from the *P. bicolor*.

angle of mouth and margin of mandible. Two isolated yellow spots on breast, and one on each side the vent below.

	In.	Lin.
Length head and body.....	3	9·25
“ head, axially, to line tympanum.....	1	
“ fore limb.....	2	8·
“ hand.....	1	
“ hind limb from groin.....	5	3·
“ tarsus.....	1	4·15
“ remainder of foot.....	1	2·25

This tree-frog, it is to be observed, exceeds the *Phyllomedusa bicolor* in size. One male with the file-like corneous plates on the metatarsus of the thumb is in the collection, from the same locality as the last. No. 6652, Mus. Smithsonian.

HEMIPHRACTUS DIVARICATUS Cope, sp. nov.

A single specimen of this species has afforded the first opportunity of investigating the structure of this genus. The result convinces me of the propriety of recognizing in it a peculiar family as Peters has done, and confirming entirely the position I assigned it in the essay on genera of *Arcifera*.* The form of the distal phalanges is a compromise between that of many aquatic frogs and that of the *Hylidæ*, the proximal globe being not recognizable, and much flattened. Its structure is different from that of *Hylodes*, though it does not probably inhabit trees any more than that genus, or *Chorophilus* and *Acris* among true *Hylidæ*.

The coracoid and epicoracoid are much less divergent than in other families, and the arched cartilages are very wide, overlapping more extensively than in any genus I am acquainted with.

The *H. divaricatus* is nearer the *H. scutatus* than to the *H. fasciatus*. It differs from the latter chiefly in the form and proportions of the helmet; this is shorter and broader, with more divergent outlines, and is plane and flat behind, and not so convex; it lacks the recurved margin represented by Peters. In profile the upper margin of the mouth is straight, not curved, and the eye is median, not anterior. Other differences are that the anterior vomerine tooth, or teeth, are abruptly longer than the others, and the throat is blackish, with a broad yellow median band. There are transverse rows of tubercles on the sides of the belly.

Interorbital width about one-third expanse of supratympanic ridges; from end muzzle to interorbital point 1·5 times from latter to concavity of posterior margin helmet. From bony orbit to tympanum equal from latter to angle of helmet.

Orbital fissure ·75 long (vertical), diameter membranum tympani, which latter is double width of same. Margin of helmet behind, medially slightly elevated. Muzzle flat with a short terminal dermal process; eyelids with a marginal prolongation. Head slightly granular above; body smooth above; oblique rows of tubercles on forearm. Belly closely, throat sparsely, granular. Both fingers and toes with rudimental web. A large palmar tubercle; two indistinct metatarsal tubercles, the inner elongate. A fold along tarsus and outer toe; slight dermal margins on all the toes. A similar fold on forearm and outer finger, and on the other fingers.

	In.	Lin.
Length head and body to vent.....	2	2·
“ of casque on mediad line; least.....		10·5
“ “ “ “ greatest.....		13·25
“ hind limb.....	2	11·5
“ foot.....	1	4·5
“ tarsus.....		7·

* Journal Academy, 1866.

Length forelimb.....	1	3·
“ hand		7·5
Width between nares		1·5
“ “ orbits.....		5·
“ casque, superiorly, behind.....		14·
“ “ inferiorly, “		16·

Grayish-brown above, dark-brown below; a yellow band from chin to breast; black bands on tarsus and forearm. A black blotch below vent, one above tympanum, one below eye (indistinct on one side), and several smaller ones on edge of upper lip.

From the Napo and Maranon. 6648.

Two specimens of two species of this genus in the Museum of Munich are the only ones known in any Museum besides the present one.

The curious and high degree of ossification of the crania of this and several other Neotropical genera, appears to be a defence to the animals possessing it. When killed in spirits they frequently die with the flexor muscles of the head contracted, and the bony front presented like a shield. This is no doubt an important defense against the bite of venomous serpents, which abound in the regions where they occur. This defence appears, however, to be rather a consequence of such structure than a cause, in a physiological sense; since the majority of the Anura in the Continental Neotropical region, where they are equally exposed to venomous serpents, do not possess it, while the tree-toads of the West Indian district, where venomous snakes are almost unknown, invariably exhibit this extraordinary ossification.

LITHODYTES CONSPICILLATUS. *Hylodes conspicillatus* Günther, Br. Z. S. Lond. 1859.

From the valley of Quito.

CYSTIGNATHUS HYLÆDACTYLUS Cope, sp. nov.

A species belonging to the section of the genus characterized by having the vomerine teeth in two arched series on the line of the palatine bones; the digits without dermal margins, and the belly included in a discoid fold of the derm.

A vertebral and dorso-lateral dermal fold, and some shorter ones on the sides, but no large warts or glands on the groin. Muzzle ovate, gradually descending at extremity, canthus rostralis not strong, contracted. Tibia less than half head and body. Ethmoid not ossified to end muzzle. Brown with a dark-brown band at each dorso-lateral fold, and two dark spots on the anterior half of each side. A dark band from axilla to orbit, from orbit to tip, and between orbits. Fore limbs not, hind limbs scarcely cross-barred; femur marbled behind. Belly and throat pale yellow.

The toes have distinct dilatations at the end, but not the fingers; all have strong tubercles below; two minute metatarsal tubercles. Tongue considerably free behind and laterally. Vomerine series not extending exterior to inner margin of nares. Tympanum one-half orbit. Wrist not quite to end muzzle; heel to middle of orbit.

Total length 11·6 l.; of hind limb 16· l.; of gape 3·1 l.; width head behind 4· lines.

From the Napo or upper Maranon.

In spite of its dilated toes this is a true *Cystignathus*. I also place in this genus *Hylodes hallowellii* Cope, and *Platymantis petersii* Steindachner. They are closely allied to each other; the latter by no means a (*Platymantis*) *Halophila*, a genus which does not occur in the new world.

BUFO NARICUS Spix.

From the Napo and Maranon.

BUFO ANDIANUS Cope. "*Bufo intermedius* Gthr.," Cope, Proc. Ac. N. Sci. Phil. 1862, 376, nec *Guentherii*, hinc *Phyrnoidis intermedius* Cope, l. c.

1868.]

Cranium with the curved orbital margin elevated into a ridge, and continued into a strong supratympanic ridge; a short preorbital ridge, no postorbital. Parotoid gland divergent towards the sides, elongate triangular narrow, continued into a lateral dermal fold. Two metatarsal tubercles, both small; a smooth-edged tarsal fold. Tympanum distinct, less than half diameter of eye. A trace of a parietal branch ridge on cranium. Canthus rostralis very strong, concave short. Muzzle elevated, profile vertical, not as long, in a straight line, as the long diameter of eye fissure. Nostril terminal. Greatest width of head 2.6 times in length head and body; length foot without tarsus 2.75 in same. Hind foot, outer toes with last phalanges only free; $3\frac{1}{2}$ of median free. Heel to hinder edge orbit. Skin covered with small round tubercles above. Palms and soles rough, and limbs generally, metacarpus with two strong tubercles. Half the femur included in the skin of the body.

Gray above, with small paired dark-brown spot on each side the median line; these are more or less confluent, and have a few smaller spots external to them. Sides below lateral fold brown-marbled. Lip with two brown spots on each side, a large brown spot on each side tympanum. A brown band across eyelid and vertex. Pale below, with brown blotches on breast and belly.

	Lin.		Lin.
Length head and body	19.5	Length tarsus.....	4.5
“ “ includ. tympanum... ..	5.4	“ long toe.....	7.5
“ tibia.	7.4	“ hind limb.....	23.

Several specimens (No. 6712) from the valley of Quito. Originally brought from Carthagea, New Grenada. (No. 4350 Mus Smithsonian.)

This species is nearest the *B. aqua*. It differs in its very much smaller size, being one-eighth or tenth the bulk of the latter, in its relatively smaller and narrower parotoid glands, and in its pinched, narrow, angulate muzzle. It is also near the *B. diptychus* Cope, a still smaller species. In the latter the toes are much less palmate, the muzzle longer and the parotoids broader.

BUFO AQUA Daud. *B. marinus* Schneider.

From the Napo and Upper Amazon.

RANIFORMIA.

Ateopus longirostris Cope, sp. nov.

The muzzle prolonged, the ethmoid cartilage overhanging the labial border, and forming an acute-angled prominence. The muzzle a little longer than the long diameter of the eye ball; nostril just behind a lateral projection formed by the extremity of the prefrontal. Canthus nostralis a right angle, lores nearly plane, upper profile entirely plane, transversely a little concave in front of the orbits. Greatest width of head behind nearly one-third length from end muzzle to end coccyx. Extended backwards the fore limb extends beyond the vent; forward the hind limb measures to the front of the orbit with the heel. Toes about half webbed, the inner quite rudimental; fingers slightly webbed, the inner short. Skin above and below entirely smooth, a line of granular elevations along the side. A faint tarsal fold; metatarsal tubercles not developed. Ostia of eustachian tubes, each half an inner nostril; latter small lateral. Tongue narrow, elongate. One large round metacarpal tubercle. Total length 10.6 lines. From nostril to posterior extremity supratympanic ridge 3.3 lines. Total length fore limb 6.6 lines; of hind do. 13.1 lines; foot 6 lines; tarsus 3.5 lines; extent of sacrum 3 lines.

Above black; under surfaces and upper lip yellow. A greenish spot on each scapular region, and two or three pairs of the same on each side the vertebral line. Femur behind yellow, with a proximal longitudinal, and two distal transverse black bands. All the toes blackish, thumb yellow.

From the valley of Quito.

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This species is in general appearance somewhat similar to the *A. varius*, from Central America, but that has a relatively longer body and shorter limbs and head, and lacks the singular nasal appendage. In this species the clavicles and coracoids are considerably more divergent. It constitutes among Atelopodes, an approximation to Rhinoderma.

In the writer's examination of the Families of Raniform Anura* the genera *Atelopus* and *Phrynidium* were accidentally retained as distinct, as was done by Günther, the fact having been lost sight of while correcting the proofs that Peters had shown them to be identical in the structure of the auditory apparatus. I do not think it probable that they should be retained as distinct on account of the remarkable difference in the degree of ossification of the ethmoid, which I have there pointed out.

The structure of the sternum in *Atelopus longirostris* throws much light on that of the genus *Hemisus*, discussed in the essay above quoted. The latter genus ought probably to have been compared with *Phryniscidæ* rather than *Engystomidæ*. I have already shown† that the clavical and coracoid are not in contact in *Atelopus*, but are connected by a simple longitudinal cartilage. This is the structure in all the *Phryniscidæ* I have examined, and is quite different from the truly Raniform character of the *Dendrobatidæ* and *Colostelthidæ*. This elongation of the confluent epicoracoid cartilages—for such is its homology—reaches its greatest extent in the family, in *Atelopus longirostris*, making a distant approach to what is probably the condition in *Hemisus*. The anterior transverse element of the latter genus is therefore probably rather clavicle than coracoid, as suggested above.

Ateopus lævis Cope. *Phrynicus lævis* Gthr. Catal. B. M.

From the valley of Quito.

Ranula affinis? *Rana affinis* Peters, Monatsberichte, Berlin Acad.

This may be Peter's species, though the latter is so briefly described that it is not readily identified. Having examined the type in Berlin, I am not prepared to agree with its learned describer that it is a climatal variety of *Rana temporaria*.

Dr. Steindachner recognizes this genus,‡ but renames it *Pohlia*, and gives it a character of cartilaginous "Stirnbeine" in front, rather than cartilaginous ethmoid.

The genus *Ranula* turns out to have simple terminal phalanges as in *Rana*, therefore three of the species formerly assigned to it by me, which have T-shaped phalanges must be regarded as belonging to another and unnamed genus. This I call *Trypheropis* and refer to *T. chrysoprasinus* m. as the type. It represents the *Hylarana* of the Old World, and bears the same relation to *Ranula* that the former does to *Rana*.

Size and form that of *Rana clamitans*, but with small membranum tympani—equal to orbit, and 1.5 length of muzzle. Toes palmate to near end of last phalange, to basis of the same of longest toe. Head plane above, fronto-parietals broad without posterior crests, equal between orbits the length of ethmoid cartilage. Canthus rostralis sharp, loreal region concave; muzzle truncate in profile. Prefrontal bones three times as long as wide. Vomerine teeth in two small fasciculi, exactly between inner nares, nearer to each other than to the latter. Nares considerably less than ostia pharyngea. Outer nostrils half as far from end of muzzle as from orbit. Skin everywhere smooth, except a few minute granulations on posterior pelvic region. Fingers elongate, the inner longer than the second, all with a narrow dermal margin. When extended, the bases of the metacarpals mark the end of the muzzle. The hind limbs extended, nearly measure to the end of the muzzle with the heel.

* Journ. Ac. Nat. Sci. 1867, 189.

† Nat. Hist. Review, 1865.

‡ Characterized Proc. Academy, 1866, 129.

Length of head (to opposite hinder margin tympanum) 14 | 5 times in length, vent equal width of head behind.

	In.	Lin.
Length head and body	2	6.5
“ of muzzle to orbit.....		4.6
“ of fore limb.....	1	6
“ of hand		8
“ of hind limb.....	3	11.5
“ of foot	1	10
“ of tarsus.....		8

Color above light olive, with a few small black spots on the pelvic region. A black line on canthus rostralis on edge of upper lip and one round tympanum. Femur and tibia each with two narrow black cross bands. * Numerous black spots on groin and front of femur. Femur and tibia behind closely marbled with deep black. Tarsus and forearm black below. An indistinct yellow band from nostril to axilla.

Two specimens from the Napo or Upper Maranon.

This species differs from the *R. palmipes* of Spix, according to the complete description of Steindachner in having a considerably shorter and more truncate muzzle. In the last named the nostril is equidistant between muzzle and orbit, and the diameter of the latter is one half the same distance; in this species it is two-thirds. Our species has the thumb longer, and the black marbling of the femoral regions is probably characteristic, as Steindachner does not mention it.

How it differs from the *R. affinis* (*Rana* Peters) the description of the latter author does not furnish the means of determining. The latter has the same obtuse muzzle.

GYMNOPHIDIA.

CÆCILIA PACHYNEMA Günther, Proc. Zool. Soc London, 1859.

Two specimens from Guayaquil. They have 170—180 annuli respectively. In the larger the eyes are distinct; there are eight teeth on each side the upper and six on each side the lower jaw, with five vomero-palatines on each side. In the smaller specimen the eyes are invisible; in both the narial valvules are present on the tongue. Günther did not find these, nor eyes, and counted only 5 | 3 | 3 teeth. He describes blue spots on the sides; these are accidental and dependent on the condition of the integument.

SIPHONOPS ANNULATUS Dum. Bibron.

From Lower Napo or Amazon.

The whole number of species brought by the Expedition is:

Crocodylia.....	1	Ophidia	34
Testudinata.....	3	Batrachia.....	16
Sauria.....	19		—
		Total.....	73

These are from three distinct faunal districts—those of the Western Coast, the Table land of Quito, and of the Eastern Slope of the Andes. The number of species found in each is as follows:

Western.....	27
Table Land.....	16
Eastern.....	44

In the Western district are five species which occur in Brazil, and one (*Chelydra*) which extends from Mexico to the cold regions of North America. Two species of the same list occur in Middle Mexico. Of the species from near Quito, four occur in the Western List, and four also found in Eastern Brazil; one is common in Middle Mexico. Of the species of the Eastern list, the Sauria were chiefly obtained from points within the limits of Ecuador, and the Ophidia from near the Brazilian frontier. Of the last, twelve are also

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Eastern Brazilian; of the first, and Batrachia, seven are found in the latter region.

Of generic types none of any extent appear to be restricted to either of the Western regions. Trachyboa with one species does not probably occur out of the West Coast region. Euspondylus, so far as known, is confined to the elevated regions and the adjoining Eastern and Western Slopes. Teleuraspis is largely developed in Central America and Coniophanes in Mexico. Of the genera of the Eastern district, Centropyx, Teius, Hysibatus, Hyla, Pithecopus, Hysiboas, Ranula, Himantodes, Olisthenes and Typhlops, have not been brought either from the Table Land or the Western district. The absence of Hyla has been already noted by Günther.

The sources of information respecting the cold blooded vertebrates of Ecuador are the collections of Fraser, made in the Western district, and identified and described by Günther in the Proc. Zoological Soc. London, 1859; and the collections of the Prussian Consul Reiss, published from time to time by Peters in the Monatsberichte of the Berlin Academy.

Fraser procured forty-nine species; to this number Peters added four, and the present enumeration four. The new species of the present list are mostly from the Table Land and Eastern region, and number twenty-four.

Additional descriptions of Neotropical Reptilia and Batrachia not previously known.

TESTUDINATA.

DERMATEMYS Gray.

This genus presents a peculiarity of the skeleton which has never been noticed. This is, that the vertebral elements of the carapace are not prolonged to the posterior marginal bones as in Emydidae* but terminate so as to allow of three costæ uniting in a median dorsal suture. This character has heretofore been supposed to characterize the Cinosternidae, which also lack the mesosternal bone. In this genus the mesosternal is well developed. Cistudo has, however, the last pair of costal bones joined by suture, and in the same family. Claudius Cope, is another genus possessing the same character. It is a character also of the genus Hydraspis.

The genus Pelomedusa Wagler I have shown† to possess only two series of phalanges instead of the usual number, three. It is on this account as separate from the other Pleurodira, as Testudo is from the remainder of the Cryptodira. On this ground I consider it to represent a family hitherto unnoticed—the Pelomedusidae.

Sternotherus Bell possesses an important structure hitherto unobserved. As in the extinct genus Pleurosternum; the hyosternal bones are divided transversely, giving ten bones to the plastron instead of eight. It therefore represents a family which I call the Sternotheridae, representing among the Pleurodira the extinct family Pleurosternidae among the Cryptodira. It may be here mentioned that I have found a fine new Pleurosternum—Pl. pectorale m.—in the cretaceous Green Sand of New Jersey.

The above facts confirm the supposition of Agassiz that the Pleurodira would be found to constitute a series of families, rather than one family.

One species of Dermatemys, the *D. mavei*, is recognized by Dr. Gray as inhabiting Venezuela and Mexico. The same species, according to the same author, has been subsequently named *Emys berardi* by Prof. Duméril. I have not had an opportunity of seeing South American specimens, but the excellent figure and description of Gray render it certain that the individuals from that country on which the species was based really belong to another species from those of Mexico. The collections of the Smithsonian Institution

* Agassiz states—Contrib. Nat. Hist. U. States i, that in all Emydidae the vertebral series of bones is uninterrupted.

† Proc. Ac. Nat. Sci. Phila., 1865, p. 185.

furnish another species from Belize, which I have heretofore identified with the same.

The species may be thus distinguished.

- One gular scute, no intergular; five inner marginals, the posterior triangular, not in contact with the femoral or abdominal. Abdominal narrower than pectoral or femoral. Sternum little emarginate behind. Vertebral scuta broader than long, the median except behind covering a keeled ridge..... ABNORMIS.
- One gular, and an intergular behind it; four or five inner marginals, the posterior in contact with femoral and abdominal; when only four, the median elongate; vertebral scuta much longer than broad; no dorsal keel. Abdominal scuta equal or wider than those adjoining..... BERARDII.
- Two gulars, no intergular; four inner marginals, the median shorter than the hinder, joined as in the last; abdominal as in the last; vertebrals much longer than wide, no dorsal keel. Sternum well emarginate behind MAVEL.

DERMATEMYS ABNORMIS Cope, sp. nov.

The greatest breadth of the vertebral plates exceeds the length of the costals; the length of the same equals the width of the anterior costals, exceeding the width of the posterior. The form of the head is elongate, and acuminate; there is a strong basal angle all round the mandible below the cutting edge. Though the carapace measures seven inches in length, the costal bones are only united for half their length, and the hyo- and hyposternal bones are entirely separated from the marginals. This lateral fontanelle is eight lines wide medially. The plastron is well developed, except a very small fontanelle at the middle of the hyo-hyosternal suture. This, with the wider vertebral shields, indicate a young animal, and though there are no signs of immaturity about the head, it doubtless is such. Nevertheless, I cannot suppose the vertebral scutes become as narrow, nor the carapace as fully ossified at maturity, as in the other species, and its distinctness is confirmed by other characters as given.

Above light brown, below and inner faces of limbs light yellow.

Length of plastron 5 in. 9 lin.; width of same at axillæ 3 in.; at posterior end 11.5 lin.; total width at groin 5 in. 5 lin.; length head from behind ear 17 l.; greatest width head 1 in.

From Belize River, Yucatan. Museum Smithsonian, No. 6545; from Dr. Parsons.

LACERTILIA.

PROCTOTRETUS Dum. Bibr.

PROCTOTRETUS PRASINUS Cope, sp. nov., of the group *Rhytidodira* Gird.

Head broad, short, vertex and front plane longitudinally and transversely. Canthus rostralis strong, loreal region concave. Nostril just below the edge of the canthus. Scales of head above smooth, angulated. A transverse scale behind rostral; a united pair of supranasals, the larger divided internasals between the smaller longitudinal posterior supranasals. Three pairs frontonasals, the two anterior in contact with canthal row, and separated by four scales; the posterior largest, and in contact. No superciliary series, except from the frontal backwards; frontal little longer than broad. Occipital (= interparietal) small, in contact with superciliary rows, and followed by two plates a little larger. Occipital and temporal regions covered with rather large, smooth scales, those of the latter smaller, and rounded behind. Supraorbitals of irregular size, smooth, the three inner larger, little broader than long; together three rows scarcely separated within by a series of small scales. Two marginal

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rows. Three loreal rows, the lower continued below the suborbital. Labials 5—6; two rows infralabials, the inner shorter, of broader scales, the first pair in contact. Auricular meatus large, no marginal scales.

Scales of dorsal region small, not larger than ventral, little larger than lateral, not longer than broad, with a keel on the distal half and obtuse mucro. They are in series, which converge upwards and backwards. Sixty-nine series from rump to occiput; fourteen across the nape. A broad granular band extends from the ears to more than the length of the humerus behind the axillæ. A pair of longitudinal folds extend from above and below the meatus, and unite half-way to the axilla, to which point the single fold extends. Another extends along the side.

Lateral and abdominal scales smooth, the latter rounded, smooth, occasionally slightly notched; gulars entire; caudal scales small, in whorls, strongly keeled. Extended fore limb reaches .66 to groin; hind limb to union of side folds of neck.

	In.	Lin.		Lin.
Total length (tail mutilated):	5	11.2		
Length to vent.....	2	7	Length to orbit.....	2.5
“ axilla.....		11.5	Width of head.....	5.5
“ meatus of ear.....		7	Length of pes.....	10

Color above brilliant green, with a double series of black dorsal spots, with angles projecting laterally, which posteriorly meet similar angles from a lateral series of larger deep black spots. The green continues as a band to orbit. A series of vertical black bars on sides; limbs green-black, cross-banded; tail brown-black ringed; top of head black, brown and green speckled. Lower jaw black-barred. Belly light green.

From 603. Museum Comparative Zoology, Cambridge. From Chili.

LIOCEPHALUS Gray.

Having had a large number of individuals of this genus at my disposal, as the species are but little known I give the following synopsis. Gray, who gives the fullest list (Catalogue Sauria Brit. Mus. 1845), enumerates five. There are at present fourteen known.

I. Several series supraorbital scales; no transverse plates. Abdominal scales smooth.

L. ornatus Gray, Catal. *L. trachycephalus* Dum., Catal. Method. The former from Guayaquil, the latter from Bogota.

II. Transverse series of plates on the supraorbital region; abdominal scales smooth.

α. Parietals and interparietals united.

Supraorbital region scaled in front; a black spot on throat. Gallapagos Is..... *L. grayi*.

αα. Parietals and interparietals distinct; the former transversely divided.

Three pairs frontonasals; three interparietals; a black spot on throat. Equador..... *L. iridescens*.

αα. Parietals and interparietals distinct; the former longitudinally divided.

β. Four pairs frontonasals (four rows plates across front).

Outer parietals larger than inner; interparietal short, triangular; two rows scales above infralabials; tail crest high. Brown, with many light cross-bars *L. eremitus*.

$\beta\beta$. Three pairs frontonasals.

γ . Outer parietals much larger than inner.

Top of head smooth; plates of front wide; interparietal long and narrow; one row above infralabials.

Light olive. Bahamas, Cuba..... *L. carinatus*.

$\gamma\gamma$. Outer parietals narrow, equal inner.

L. vittatus Hallow. and *L. macropus* Cope, both from Cuba. *L. schreibersii* (*Pristonotus schreibersii* Gravenhorst, not *L. schreibersii* Gray = *L. vittatus*), and *L. melanochlorus* Cope, from Hayti.

$\beta\beta$. Two pairs of frontonasals.

Scales smaller; temporal scales small, keeled; of front much keeled; auricular scales elongate; interparietal very small. Hayti..... *L. raviceps*.

Scales larger; temporals large, smooth; anriculars short, thick; scales of front little keeled. From Hayti *L. personatus* and *L. trigeminatus*.

The last two are much alike in structural features, but differ greatly in coloration; they do not appear to be sexes of the same animal, as I have seen both ♂ and ♀ of the latter.

III. Transverse series supraorbital plates; abdominal scales keeled.

Scales on nape in 5—1—5 rows; seven supraorbitals; frontal scales many, keeled.

L. herminieri Dum. Bibr., from Martinique.

I am not acquainted with *L. macleayi* Gray, from Cuba; it is probably allied to the *L. carinatus* and *L. vittatus*.

LIOPHEPALUS EREMITUS Cope, sp. nov.

Head moderately elongate, profile an inclined plane. Front with four cross-rows of plates posterior to supranasals, the posterior smallest; two pairs of internasals, separated from each other, the anterior from the rostral also; the posterior pair of the same in line and continuous with the divided frontal. Interparietal very short, the parietals largely in contact behind, the outer twice as wide as the inner. All the scales of head smooth, except the supraorbitals. The latter weakly keeled, six on each side, separated by one row scales from supraorbitals; also by one row small scales from superciliaries. Parietals bounded externally by two rows larger scales, then minute scales, then medium keeled preauriculars. Auricular scales elongate, four. Postauriculars not granular. Scales above large, eight rows on median nuchal region. Dorsal crest high on tail, elsewhere moderate. Lateral and abdominal scales smaller than dorsal. Scales of lower surfaces entire, the preanals smaller, keeled. The muzzle marks the end of the metacarpus on the extended fore limb, and the front of the orbit the longest toe. Tail moderately compressed. Folds of side of neck strong; two oblique, one nearly horizontal. Scales of tail shiny, keeled below except at basis.

Coloration plain. Ground dark olive-brown, with a deep brown dorso-lateral longitudinal shade, connected by numerous indistinct cross-bars, which are light margined behind. Lower surfaces brown, with numerous scattered whitish scales, which are most thickly gathered on the pectoral region. A dark brown spot between eye and ear.

	In.	Lin.
Length from end muzzle to vent.....	2	5.5
" " to ear.....		8
" of hind foot.....		13.5
Width of head.....		6

One specimen of this species was sent to the Smithsonian Institution by W. J. Rasin, from the island of Navassa, W. I., which lies to the south-west of St. Domingo, in line with Jamaica.

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LIOCEPHALUS SCHREIBERSII. Pristonotus schreibersii Gravenhorst, Nova Acta Curios. xviii, 739. Tab.

This species is not anywhere described in the English language. I therefore append the following, which I took from specimens in the Mus. Leyden :

Crest very long, equal ; scales longer than high, other sc. small, keels not prominent. 7—1—7 sc. on nape ; on rump, 7 or 8—1—7. Smaller lateral sc. in a not wide band. Abd. sc. in 23 rows, rhombic. Sc. from ear to shoulder granular ; tail compressed. Extended hind limb, near to ear. Interparietal narrow ; 8 supraorb. Supercil. not separated. 3 pair frontonas., the poster. often double ; 4 in the median row ; the frontonas. as broad as long. Head sc. keeled.

Olive-brown ; with or without traces of a light band on each side of back, which are most distinct on tail ; sides with a band of brown speckles. Green below, with 4 or 6 cross-bands of blue-white bordered spotlets ; obsolete anteriorly. Bluish on gular region. Head lighter, uniform ; feinus with two transv. series of spots ? Fem. with 2 longit. dors. stripes, and a distinct one on lower part of each side. Transverse angulated brown bands behind white border, from side to side. A yellow band on post. face of femur. Dors. crest very small, scarcely on tail. Head sc. broad, keeled.

CELESTUS Gray.

Catal. Lizards Brit. Mus., 117.

This genus, in my opinion, embraces the Diploglossinæ, with normal extremities, in which the frontonasal plates are fused together in one shield ; it therefore includes most of the species of Diploglossus, as understood by Gray. Diploglossus was originally based by Wiegmann on *D. monotropis* and *D. fasciatus*, species in which the frontonasals are quite distinct. Both are from the South American continent ; the first-named is the type of *Camilia* (*C. jamaicensis*) of Gray. The correspondence of the Smithsonian Institution has procured numerous additions to this genus, which are here added :

A. Internasal plates confluent with frontonasals.

I. Scales in 32—6 rows.

Two frontals, one above the other ; two postnasals do. ; scales all 8—10 keeled ; olive, sides black-spotted, STEINDACHNERI Cope.

One frenal and postnasal ; scales smooth in front, keels increasing to 16 on tail ; sides and limbs black ; above olive, the scales black-edged..... CHALYBEUS Cope.

Keels of the scales eight to ten ; one postnasal, two frenals, both on labials ; meatus of ear large ; anterior limb two-thirds head. Brown, with blackish band on upper part of each side..... PLEII Dum. Bibr.

Keels of the scales eleven, all equal, on posterior regions ; anterior scales smooth, together in 36 rows ; nasal plate extending to rostral ; two loreals, both higher than long ; ear minute, head and limbs very short, latter .75 former, and .2 from axilla to groin ; a blackish lateral band above, cross-lined before, spotted behind..... DEGENER Cope.

Keels of the scales fifteen, all equal ; one postnasal, two frenals, both on labials ; ear meatus small. Serpentine, fore limb five-sixths head. Brown, with dark lateral band above..... SAGRÆ Coct.

II. Scales in 41—2 rows.

Keels 14 ; none larger ; head narrow, sharp, muzzle longer than interorbital width ; front plane ; parietal separated from supraorbitals by two plates, loreal longer than high ; gray, sides black, cross-banded ; loreal higher than long ... PHOXINUS Cope.

- Keels 15, a median stronger; front convex; distance between orbits in front equal length muzzle; both loreals higher than long; one plate between parietal and supraorbitals; brown, a deep brown dorso-lateral band, and numerous longitudinal series of brown spots on the back..... WEINLANDII Cope.
- Keels 25, none larger; head flat, acute, muzzle longer than interorbital width; many close, short bay stripes; loreal higher than long..... BADIUS Cope.
- Keels 25 to 35, one median much stronger; head shorter, obtuse, muzzle equal width between eyes; unicolor, with vertical lateral bars; two loreals, longer than high..... STENURUS Cope.

III. Scales in 49—51 rows.

- Keels 34—8, the median stronger on dorsal region; form stout, fore-limb one-third longer than head; tail much compressed; yellow or light brown, with about fifteen brown cross-bands..... OCCIDUUS Shaw.
- Keels 17, scales with a cross elevation and marginal depression, making rows of pits; head wide, muzzle short, equal interocular width; tail cylindrical; brown, with 18 cross-bars on dorsal region..... IMPRESSUS Cope.
- Keels 19, equal, scales plane; head elongate, narrow, muzzle longer than interocular width; brown, with 14 cross-bars on back..... ?STRIATUS Gray.

AA. Internasal plates separate, small.

Scales in twelve longitudinal series on the dorsal region, with fifteen striæ and a weak median keel; body anguiform, anterior limb long as head. Pale, with numerous short longitudinal reddish bands.

Otherwise as *C. occiduus*." Dum. Bibr..... OWENII D. B.

Species unknown to the writer: *C. hewardii* Gray, Catal. l. c., from Jamaica, and *C. macrolepis* Gray, l. c., West Indies.

Synopsis of Species.

- C. STEINDACHNERI* Cope. *Diploglossus* Cope, Proc. Ac. N. Sci. Phila. 1864.
Vera Cruz, Mexico. Mus. Smithsonian.
- C. CHALYBEUS* Cope. *Diploglossus* Cope, l. c. 1866.
Vera Cruz, Mexico. Mus. A. N. S.; Smithsonian.
- C. PLEI M.* *Diploglossus* Dum. Bibr., v, 605. *Do.* (*oneyda*) Gray, Catal.
Hab.—Martinique (Mus. Paris).

CELESTUS DEGENER Cope, sp. nov.

This is the most Seps-like of the genus, having shorter and weaker limbs than the *C. sagrae*, and a shorter and broader head. The toes are very short, though of the normal number; it perhaps will approach the genus *Sauresia* Gray.

Width between fronts of orbits 1.5 times in length of muzzle anterior to same. Length of head to middle postparietal plate equal width of same at ear openings. Width of frontal plate behind greater than length of the same. Supraorbitals five, separated by two scales from parietal. One preocular; two loreals, both higher than long; an elongate oblique postnasal in contact with anterior supranasal. Nasal meeting rostral by a suture. Eight upper labials, fifth and sixth supporting a long suborbital, which is convex below. Two rows of infralabials, the upper of longer, lower of wider scales. Toes short; behind, fourth much shorter than first. Whitish below; chin reticulated with

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brown. Sides with longitudinal brown lines, the upper confluent, much darker, and with a zig-zag upper margin. Above, fawn brown, with seventeen cross lines to middle of back, and small brown spots in quincunx behind them. Tail with a deep brown band on each side.

	In.	Lin.		In.	Lin.
Length to vent.....	3	2.25	Length fore limb.....	4.6	
“ to axilla.....	11.75		“ hind limb.....	7.	
“ to ear.....		5.6			

A single specimen of this interesting species is contained in a collection from Porto Rico, West Indies, sent to the Smithsonian Institution by George Latimer, correspondent at that island.

C. SAGRÉ. *Diploglossus* Cocteau, Hist. Isle Cuba, Dum. Bibr. v, 602.

Hab.—The whole of Cuba. Mus. A. N. Sci.; Smithsonian.

CELESTUS PHOXINUS Cope, sp. nov.

A fusiform species, the body rather stout and flattened, the outlines tapering gradually to end of muzzle and tail. Head flattened, with strong canthus rostralis, and concave loreal region. Postnasal and postloreal longer than high; preloreal higher than long. Five supraorbitals; scales behind postparietals not larger than those of the nape. Dorsolateral angle strong on scapular region. The eighth upper labial is the first one angulated above; rostral plate broad and low. The limbs, when pressed to the sides, fail to meet by the length of the hand. Keels of the scales strong. Tail slightly compressed.

Above light gray; sides from orbit to groin dark brown, with regular vertical brown bars, which are margined behind by a close series of light spots. Two series of small brown spots on each side the dorsal region, the median stronger on the nape, all vanishing behind. Below immaculate; limbs with brown light-edged cross-bars.

	In.	Lin.		In.	Lin.
Length to vent.....	3	3.	Length to orbit.....	3.	
“ to axilla.....	1	2.8	Greatest width head.....	4.8	
“ forelimb.....		8.6	Length hind limb.....	1	0.1

This elegant species was found by Dr. D. F. Weinland, near Jeremie, Hayti, and was placed by him in the Museum Comparative Zoology, Cambridge, Mass., in care of Prof. Agassiz.

CELESTUS WEINLANDII Cope, sp. nov.

This species is near the last, but is less regularly fusiform; the body, and especially the head, are less depressed; the canthus rostralis is depressed and the loreal region plane. Both loreals higher than long, and the seventh upper labial is the first angulated above. Rostral deeper, rounded above. Five supraorbitals, separated from parietals by but one plate besides frontoparietals. Auricular opening small. Limbs when pressed to sides meet. Larger median carina of scales wanting on those of anterior nape and tail. Vent with three cross rows, rather larger scales in front.

Below the dorsolateral brown band is another formed of spots in line; they continue with a vertical series of brown spots on the sides. Ground above dark brown; sides of neck and gular region brown-lined. Limbs with brown reticulations.

	In.	Lin.		In.	Lin.
Length to vent.....	3	6.8	Length fore limb.....	9.7	
“ to axilla.....	1	4.	“ hind limb.....	1	2.4
“ to orbit.....		3.	Width head.....		5.9

This species is found on Gonave Island, on the western side of Hayti. Mus. Smithsonian. From T. Younglove. Named in honor of Dr. F. Weinland, M.D., of Frankfort o. M., who has contributed much to the history of the Reptilia of Hayti.

1868.]

CELESTUS BADIUS Cope, sp. nov.

This species, though larger than either of the preceding, possesses a more acute muzzle; the front is plane as in *D. phoxinus*, but the snout lightly convex, though less so than in *D. weinlandii* and with obtuse canthus rostralis and plane loreal region.

The (sixth or) seventh upper labial is the first angulated above, while the suborbital and lower postorbital plates are shorter and deeper than in the preceding species; both loreals higher than long. There are two plates besides the fronto-parietal between parietal and the posterior of the five supraorbitals.

The limbs are short, and when pressed to the side fail to meet by the length of the hind foot. The digits of the fore foot are relatively shorter and weaker than in the two species preceding.

The eye fissure is small, measuring 2.5 times from its hinder margin to the ear; but twice in the *D. weinlandii*; it is less than double the diameter of the meatus. Transverse series of scales, from groin to above middle of meatus, ninety-four; those of the tail keeled like the rest. Three rows larger preanal scales.

	In.	Lin.		In.	Lin.
Total length (?tail reproduced.)	8		Length fore limb.....	9	
Length to vent.....	4	1	“ hind limb	13	5
“ to orbit		4.5	“ hind foot.....	6	3
Greatest width head.		7.5			

Ground color cream, almost obscured above by many longitudinal bands and lines of bright bay; these are more or less broken up, of irregular width, and often confluent. Top of the head and sides closely spotted with bay, on the latter region in a longitudinal direction or in lines directed obliquely downwards and forwards. A dorsolateral band of ground color extends from superciliary region, more or less completely to the iliac, and is bay margined below and sometimes above. Throat and belly uniform yellow. Limbs bay red with white spots.

From Island of Navassa, W. I. From W. J. Rasin.

The collection sent to the Smithsonian Institution from this small Island consists of the following species:

<i>Typhlops sulcatus</i> Cope,	<i>Metopocerus cornutus</i> Wagl.,
<i>Ungalia pardalis</i> Gosse,	<i>Celestus badius</i> Cope,
<i>Liocephalus eremitus</i> Cope.	

CELESTUS STENURUS Cope. *Diploglossus* Cope, Proc. A. N. Sci. Phil. 1862.

From near Jeremie, St. Domingo. Mus. Compar. Zoology, Cambridge.

I append a description of another specimen, referred to this species with doubt.

This is a large species with broad head, and short muzzle, the latter being shorter than the width between anterior margins of eye fissures. First upper labial angulated above the seventh; suborbital and lower postorbital elongate, narrowed. Nasal very small; preloreal higher than long, loreal nearly square. Front convex, canthus obtuse. Eye fissure one-half distance to meatus of ear.

Eighty transverse rows scales from above meatus to groin. Supranasal plates small, narrow, the posterior nearly divided by the anterior (right) angle of the elongate internasal. Scales with from 26 to 35 keels, a median one rather stronger on some. Two scales bound the parietals in front besides the fronto-parietals. Four rows large scales in front of vent. The limbs pressed to the sides nearly meet.

Light-brown, with three rows of small subquadrate dark-brown spots on the median dorsal region. Limbs brown with light spots arranged in indistinct cross-bars. Head above light-brown with darker shades; labial plates above and below broadly brown margined. Below immaculate.

Length to vent 5 in. 9.7 lin. To orbit 5.1 lin. Width head behind 9.6 lin.

A number of digits in this single specimen exhibit a loss of the claws, others

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have lost one, two or three phalanges. This may have a natural cause, since the allied genus *Panolopus* is deprived of these members entirely, though with well developed limbs.

From Gonave Island, near Hayti. From Thos. Younglove. The reptiles found by this correspondent in this Island are :

<i>Homalochilus fasciatus</i> Fisch.,	<i>Diploglossus weinlandii</i> Cope,
<i>Dromicus parvifrons</i> Cope. (<i>D. pro-</i>	<i>Diploglossus ?stennurus</i> Cope,
<i>tenuis</i> Jan),	<i>Ameiva chrysolama</i> Cope,
<i>Uromacer catesbyi</i> D. B.,	<i>Trachycephalus marmoratus</i> D. B.,
<i>Uromacer oxyrhynchus</i> D. B.,	<i>Lithodytes lineatus</i> Grav.,
<i>Liocephalus</i> .	

CELESTUS OCCIDUUS Gray, Catal. *Lacerta occiduus* Shaw. *Diploglossus Shawii* Dum. Bibr., Erp. Gen. v, 590. Jamaica. Mus. Smithsonian.

CELESTUS IMPRESSUS Cope, spec. nov.

This is an elongate species with a tail cylindrical for its proximal half, a little depressed at base; the body is quite cylindrical and the limbs short. The ear is large and the head abruptly widened at the temples. The muzzle is short and flat, and the superciliary regions are slightly elevated above the frontal plane. Loreal region grooved. Ten upper labials, of which the eighth rises between suboculars. Postnasal distinct, prenasal much higher than long, frenal square, two preoculars. Scales with equal keels, their hinder halves depressed.

The limbs appressed to the sides fail to meet by the length of the anterior without the hand.

	In.	Lin.		In.	Lin.
Length to posterior edge ear...	10.2		Length fore limb.....	11.66	
“ to axilla.....	19.75		“ hind limb.....	15.3	
“ to vent.....	3	8.75	“ tail (reproduced).....	5	9.

Color above olivaceous, below yellowish. Back and sides crossed by about 18 narrow brown bars, which are three times broken and alternating on each side the middle line. Tail cross-lined, throat and breast cross-banded less distinctly. Lateral plates, a short band behind orbit, and four quadrate spots above throat and axilla, deep brown.

Two specimens in Mus. Academy from Jamaica, collected by Charles B. Adams.

CELESTUS STRIATUS Gray, Ann. Nat. Hist. ii, 288. Catal. Brit. Mus. *Diploglossus cliffii* Dum., Bibr. v, 596. Jamaica. Mus. Academy, Phila.

CELESTUS OWENII m. *Diploglossus* Dum., Bibr., do. (*Oneyda*) Gray, Catal. B. M. *Habitat*.—Unknown. (Mus. College Surgeons, London.)

AMEIVA Cuvier.

AMEIVA CHRYSOLEMA Cope, sp. nov.

Char.—Twelve series abdominal plates; no horny tubercles on the heel; median and lateral gular scales equal. Frontal undivided, supraorbitals four. Teeth mostly bicuspid. Olive with numerous series of white spots, sometimes indistinct on dorsal region. Gular fold black, throat yellow; belly green and yellow.

Description.—One of the larger species. Four parietals and one interparietal, subequal. Two posterior supraorbitals bounded by granules within; frontal in front nearly broad as long; prefrontals longer than broad. Nostril in nasal plate near suture. A postnasal, one very large frenal, two preoculars and two suboculars. Labials 6—7, the anterior in both series very narrow. Infralabials eight in lower series, three in upper behind, all separated from labials by 1868.]

granules. Gular fold margined broadly with granules, with three larger series of hexagonal scales.

Brachials rather small, in seven rows above, and two below, not separated from antibrachials by granules, but joining an area of small scales in seven rows above, and ending in one row of broad and one of narrow antibrachials below. Postbrachials small, three rows larger. Tibial plates in four rows, two on under face, the outer of seven plates, of which the third and fourth are very large. Outer toes just exceeding inner. Femoral pores twenty.

	In.	Lin.		In.	Lin.
Total length.....	16	9.	Length to orbit.....	8.	
Length to vent.....	5	5.	“ of fore limb.....	2	1.
“ to edge collar.....	1	10.5	“ of hind limb.....	3	9.
“ of anterior claw.....		3.	“ of hind foot.....	1	10.5

Olive-green with five series of small white spots on each side, and seven on the dorsal region. The latter tend in a smaller specimen to form two pairs of incomplete dorsal stripes. Upper arm and hind leg with small white spots. One or two series white spots on the lateral abdominal scales. Latter blackish olive-yellow margined.

The anterior claws of this species are particularly large, and slightly curved. There are twenty teeth on each maxillary bone, which are nearly all bicuspid, the longest cusp posterior. In one individual there are mingled with these, posteriorly, three tricuspid.

Two specimens sent to Mus. Smithsonian from Gonave Island, on the west-side of the Island of Hayti, by Thos. Younglove.

OPHIDIA.

TYPHLOPS Schn.

TYPHLOPS SULCATUS Cope.

This species exhibits most of the characters of the *T. lumbicalis*. These are, the presence of a preocular plate, the obtuseness of the muzzle plates, four upper labials, a nasal entirely divided by the suture through the nostril, and twenty longitudinal rows of scales.

It differs in the much greater prolongation and depression of the muzzle, and hence more slender form of the rostral and nasal, and greater prolongation backwards of the upper part of the preocular. In the existence of a strong groove along the sutures of these plates, giving the muzzle a trilobate outline from above. In similar deep grooves along the upper sutures of the labials and around the small frontal superciliary and interparietal scales. These scales are not larger than those of the body; a pair in place of the parietals are larger. The body is more slender than in *T. lumbicalis*, the length of the tail entering it 44.1 times. Tail short, acuminately conic. The length of the muzzle beyond the mouth equals from the nostrils to the opposite side of the rostral plate, or one-half the tail's length.

Color pale yellowish-brown; a darker brown line in the middle of each row of scales, on the anterior third of the length.

Total length 6 in. 5.2 l.; of tail 1.75 l.; greatest diameter 2 lines.

One specimen in Mus. Smithsonian from Navassa Island, southwest from St. Domingo:

UNGALIA* Gray.

Tropidophis Bibr. *Notophis* Hallowell.

Thirty-five individuals, representatives of this genus before me, indicate a greater number of species than are at present recognized by naturalists. Some of the additional ones have been already named and imperfectly described.

All that are known are from the Bahamas, Cuba, Navassa and Jamaica, a remarkably local distribution. They are distinguished as follows:

* The correct spelling of this name is probably Ungualia.

I. Scales in twenty-seven rows, keeled.

Gastrosteges from 200 to 209; five or six lateral rows smooth; yellow with black end of tail..... MELANURA.

Gastrosteges 169—189, nine or more lateral rows smooth; brown with rows of brown spots; tail not black.... PARDALIS.

II. Scales in twenty-one—five rows.

α. Scales keeled, a larger dorsal row;

Gastrosteges 168; scales in twenty three rows; gray with small dorsal spots..... CANA.

αα. Scales smooth, dorsal rows equal.

Short, stout, gastrosteges 142—150; head lanceolate; scales in 23—25 rows; brown or gray with usually dorsal and lateral spots..... MACULATA.

Long slender, head small lanceolate; gastrosteges 202—5; scales 21—3 rows; yellow with nearly complete broad brown rings or half rings..... SEMICINCTA.

Long slender, head broad short; gastrosteges 211, scales 25 rows; brown with six rows of black spots..... DIPSADINA.

The normal number of postoculars in this genus is three, but variations are not unrequent. Thus a specimen of *U. maculata* has but two postoculars on each side, another has two on one side only. Another has a complete circle of five scales round the eye on one side, and three postoculars on the other. I have seen no specimen with two preoculars as in the specimen figured by Jan as *T. distinctus*, but as the species does not appear otherwise different from *U. maculata*, I suspect that this character also falls within the range of the variations of the latter.

UNGALIA MELANURA Gray, *Boa*, Schlegel.

There are two varieties of this species.

α. A narrow brown vertebral line; crown not spotted; (*Notophis bicarinatus* Hallow.), three specimens from Cuba, two of them from the east; one with two keels on the vertebral row, the others with one.

β. (*Boa melanura* Schleg.) Two dorsal series of brown and gray spots, top of head much spotted. Five sp. from Cuba.

UNGALIA PARDALIS, *Boa Pardalis* Gosse, *Ungalia maculata* Gosse.

Var. α. Shorter, gastrosteges 169; eight rows of spots, belly blotched. One sp. from Jamaica (Adams coll.) Smithsonian, 5763.

β. *U. bucculenta* Cope. Larger, gastrosteges 186—9; four rows of spots, dorsal pairs much confluent, belly specked; head swollen behind. Four specimens from Navassa Id. Mus. Smithsonian. The largest of these measures 25 inches in length.

UNGALIA CANA Cope, sp. nov.

This species is intermediate between the *U. pardalis* and *U. maculata* in many respects. Superior labials ten, all higher than long; orbitals 1—3. Internasals longer than broad; prefrontals broader than long; postfrontals pentagonal, nearly equal sided. Temporals 3—3—4. Scales, except six external rows, weakly carinate. Muzzle narrow, acuminate, head rather wide behind; diameter of eye a little over twice in length muzzle. Total length 13 in. 9 lin.; tail 16.5 lines. General form neither very stout nor slender.

Color gray brown above, below yellowish gray, densely punctulated at middle of gastrosteges. A series of tolerably approximated transverso-dorsal spots, which are short, and little distinct, in some specimens almost wanting. On each side on the third row of scales is a series of black dots two or three scales apart. A brown band from eye to side of neck, the labials below it yellowish; mental region yellowish.

Several specimens from the Bahama Island of Inagua sent to the Smithsonian.

1868.]

UNGALIA MACULATA Gray. *Tropidophis* Bibron. *Tropidophis distinctus* Jan. Elenco et Iconographic.

α. Two rows large spots on each side, the upper series usually confluent; a large series each side the vent extending half across it; eight specimens from Cuba.

β. Two rows small spots on each side, those of the dorsal rows separate; no large blotches on the belly. Three sp. from New Providence; Bahamas.

γ. Gray without spots or with traces only. Three sp. from New Providence.

In this species two or three labials may enter the orbit irrespective of the number of postoculars.

UNGALIA SEMICINCTA. *Ung. maculata*, var. *semicincta* Gundlach and Peters, Monatsberichte Preuss. Acad. 1864, 388.

This is a handsome and distinct species, described as a variety as above, most probably, though the authors have not noted its essential peculiarities of proportions of body and the number of scuta.

Three specimens (2 Smithsonian, 5746) from Eastern Cuba. Chas. Wright.

UNGALIA DIPSADINA Cope, sp. nov.

This is a long slender species, much compressed, with slender neck, and small flat and broad head; its form is thus more like that of *Dipsas* than any other of the genus. The anterior upper labials are larger than in the other species, the second reaching to the preocular on one side, and within a hair's breadth on the other. Ten labials on one side, nine on the other, two only in orbit. Oculars 1—3; temporals 3—3—4; internasals and prefrontals of equal length; occipitals short, separated by two scales. Eight dorsals, and the basal series of scales larger than the lateral scales, some of the latter slightly roof-shaped. Two pairs of longer genials. The eye is larger than in the other species, its diameter entering the length of the muzzle 1.5 times. The width of the head behind nearly equal its length from the end of the muzzle to near the end of the occipitals. The diameter of the body an inch behind the head, one half that of the thickest part of the body. Urostegeas 42.

Color above a deep reddish brown, with a row of black spots on each side the median line about two scales wide, and always distinct, and two alternating rows of smaller black spots on each side. A series of blackish cross-bars on the belly, two and three scuta apart, sometimes divided and alternating, invade the first row of scales; no spots for two inches behind the chin. Head dark above, with a darker spot on the occipital region. Ground color below, yellowish brown.

Total length 15.5 in.; of tail 2 in.; of gape 6 lin.

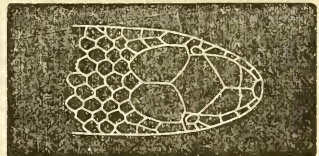
Habitat.—Cuba, section unknown. Discovered by my friend Prof. Poey, of Havana, who sent a specimen to the Museum of the Academy of Natural Sciences.

COLOPHRYS Cope, gen. nov.

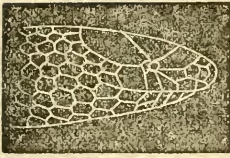
Teeth equal. Anal shield simple, subcaudals divided. Two pair genials and frontals; no preocular or superciliary, the vertical forming the eyebrow; two nasals. Scales smooth.

COLOPHRYS RHODOGASTER Cope, sp. nov.

Scales broad, in seventeen longitudinal series. Head slightly contracted, obtuse, depressed. Rostral shield visible from above; prefrontals moderate, their common suture little less than that of postfrontals; nasals large, as long as loreal,



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postnasal longer. Vertical (frontal) angulated in front, more acutely behind, where it has two sutures on each side, owing to its confluence with the superciliaries—the exterior being the posterior sutures of the latter. Parietals much longer than wide, only margining anteriorly the whole of the narrow single postorbital. Labials six, all higher than long except the sixth, which only is separated

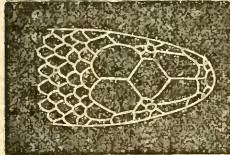
from the parietals by a single temporal. Second superior labial in contact with postnasal and more with boreal; third and fourth with orbit and postocular. Inferior labials seven, five in contact with genials. Scales in contact with parietal, 1 temporal, $4\frac{1}{2}$ squamæ. Gastrosteges 144, urosteges 30; in a second specimen 140—41. Length of largest specimen 12 inches; tail 2 in. 1.5 lines.

Color of upper surfaces a rich slate brown, very iridescent; lower surfaces, including first series of scales with labial and rostral shield, red orange.

Three specimens of this species were brought by Dr. Van Patten from the elevated country in the neighborhood of the city of Guatemala. It bears considerable resemblance to the *Catostoma chalybæum* Wagler, but besides the lack of superciliary shields, its eye is smaller and the head more compressed. In the *C. chalybæum* there are but six inferior labials, of which four margin the genials; it has also shorter nasals, and a vertical more truncate anteriorly.

CATOSTOMA Wagler.

CATOSTOMA NASALE Cope, sp. nov.



This species has, like that preceding and that following, seventeen rows of scales, of which those on the posterior part of the body and tail are weakly keeled, thus differing from the *C. chalybæum* where they are smooth. It also differs much from the same in the elongated form of the head and the great disparity in size between the pre- and postfrontal shields. In this species the former are less than one-fourth the latter in longitudinal extent, and about half in the transverse. The supraorbitals are very small and subtriangular, the vertical broader than long, and what is unusual, as much angulated anteriorly as posteriorly. Parietals longer than broad, the anterior margin touching the postocular and superciliary. Superior labials eight, the last only separated from parietals by a temporal, which is large in two, small in one specimen. First labial very small, third longer than high. Inferior labials seven, four in contact with genials. Seventeen rows of scales,

which are small and more crowded above the vent than in any other species. Gastrosteges in three specimens 131—3—4; urosteges in the same 25, 30.

Color above, including labial region and chin, iridescent slate brown; belly and gular region pale yellow. Length of largest specimen 11 in. 1.5 lines; tail 2 in.

This species is probably nearly allied to the *C. sieboldii* of Jan, of which but few peculiarities are described. Jan's account of the scutellation indicates a more elongate species no doubt distinct; the scuta vary from g. 146—154, u. 34—8.

Several specimens from near the city of Guatemala, presented to the Smithsonian Institution by Dr. Van Patten. Mus. Ac. Nat. Sci. Phila.

1868.]

RHADINÆA Cope.

The genus *Rhadinæa* is nearly coextensive with *Henicognathus* Jan, and *Ablabes* Günther. *Ablabes* Dum. Bibr. was, however, established on the *Coronella rufula* of Schlegel, which has the prolonged series of gastric hypapophyses, and is therefore quite different, while *Henicognathus* is characterized by a peculiar structure of the mandible, which so far as I am aware occurs in only one American species, the *H. annulatus* D. B. Consequently the majority of species attached to this genus belong to *Rhadinæa*, as the *E. melanocephala* D. B. etc. In the description of this last species, three are mingled, as I have ascertained both from a reading of the same, and from an examination of the originals in Mus. Paris. One of these is our *R. obtusa*, the other is the true *R. melanocephala*, which should be described as follows, and the third is a species as yet undescribed, which I call *Lygophis nicagus* Cope. Duméril and Bibron give both the Island of Guadaloupe and Brazil as habitats of their species. I suspect, however, that the specimen of *R. obtusa* was accidentally introduced into the jar containing the other two, and that it is confined to South America, where it is not uncommon. It is figured by Jan in his *Iconographie*, as the second specimen of *R. melanocephala*. His first specimen of the same as figured, is our *Lygophis nicagus*, a serpent with a diacranterian dentition.

The true *R. melanocephala* is probably confined to Guadaloupe and the neighboring islands. Its description has been so mingled with those of the two other species as to require a redescription. It is to be regretted that this, the type of the species, should not have been figured in the beautiful work of Jan and Sordelli.

RHADINÆA MELANOCEPHALA. *Henicognathus melanocephalus* D. and B., part.

Head broader and shorter. Common pre- and postfrontal suture $2\frac{1}{2}$ times in length, from vertical ant. sut. to end occip. suture, and equal diam. eye. Vertical a little longer than occip. Common sut. occip. = anterior sut. occip. ! Postfront. descending low on (sides of) loreal seg. Loreal longer than high, 8 and 9 sup. lab., 4 and 5 or 4? 5 and 6 in orbit; of the 3 behind the 5th or 6th—1st is higher than long, 2d longer than high, 3d and last of all twice as high as long. Temporals 2 | 2 | 2 | the infer. of 1st row between penult. and antepenult. labials. Yellow band round canthus rostralis and upper part of rostr. plate edge of supcil. and across post. part of sapeil. and vert.; brown area enclosed. Occips. brown, connected by long. line with broad brown collar yellow edged, which is 6 scales long. Yellow vertebr. band on median row sc. with occasional round brown spot on a single scale, small round spot on end gastrosteges. Labials yellow, edged above with brown. Tail 10''. Total 32'' 5'''.

From Guadaloupe. Mus. Paris.

LYGOPHIS (Fitz.) Cope.

LYGOPHIS NICAGUS Cope. *Henicognathus melanocephalus* Jan, *Iconographie* Livr. xvi. Tab. 1, fig. 4, (not of Dum. Bibr.)

Length of comm. suture of pre- and postfront. one-third dist. from anter. suture vertic. to end of comm. sut. of occipitals. Vert. long, sides straight, converg., as long as comm. sut. occip. Occip. long, a little divaricate at tips. Diam. eye = comm. suture pre- and postfronts.; 7 sup. lab.; 3, 4, 5 in orbit; 7th largest, higher than long, 8th longer than high. Loreal higher than long. Temp. 1 | 2, 17 r. sc. Below yellow, immaculate, near end of gastrost. a longit. spot, forming together longitud. line. Above this line brown, darker to 4th row of sc., forming band with numerous light points mixed; and on 8, 9, 10 rows where a median longitud. band is formed with undulatory edges and varied with whitish points. On anter. part body the intermediate

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pale lateral band crossed by vertical brown bars. Dark spot on nape and middle of occip., which are bordered all round with pale and have a pair pale spots in middle (Tropidonotus style.) Superciliar. with a posterior border. Tail 7'' 7'''. Total 36'' 3'''.

XENODON Boie.

A review of the species of this genus is given by Günther in Ann. Mag. N. History, 1863, 353, in which he enumerates six species. He omits the East Indian species, and places them in Tropidonotus in his volume on the Reptiles of British India,—an arrangement which I had long thought necessary, on account of the hypapophyses of the posterior vertebrae of the latter (vide Proc. Acad. 1864). Jan places *Liophis bicinctus* of Dum. Bibr. with *Xenodon gigas* D. B., a closer approximation to nature than any other arrangement. He, however, regards them as a genus distinct from *Xenodon*, the truth of which position I doubt, and refer them both to *Xenodon*. The species of the latter genus will then be as follows, two not previously known being added:

I. An orbital ring of scales.

X. bicinctus. *X. gigas* Dum. Bibr.

II. One labial entering the orbit.

X. irregularis Gthr.

III. Two labials entering orbit.

α. Eight superior labials.

β. Anal bifid.

X. severus L. *X. neovidii* Gthr.

ββ. Anal entire.

X. colubrinus Gthr. *X. suspectus* Cope, sp. nov. *X. angustirostris** Peters.

αα. Seven superior labials.

X. rhabdocephalus Boie.

I have before me, of *X. gigas* two sp., *X. severus* five sp., *X. neovidii* one sp., *X. colubrinus* three sp., *X. suspectus* one sp., *X. angustirostris* four sp.

XENODON SUSPECTUS Cope.

Scales in nineteen longitudinal rows, in transverse series and very imbricate. Body rather slender, compressed, head distinct ovate, plane in profile, the muzzle not depressed or arched. End of muzzle not projecting; eye large, contained $1\frac{1}{3}$ times in length muzzle, and $1\frac{2}{3}$ in interorbital width.

Prenasal more elevated than postnasal; loreal large, higher than long. Two postoculars, the superior considerably more elevated, in contact with one temporal, which is higher than long; sixth and seventh labials higher than long, the seventh not reaching postoculars, separated from occipital by two temporals. Last labial a little longer than high. Supraorbitals each a triangle truncate anteriorly. Frontal nearly long as broad, subtriangular, the occipital sutures being very short. Occipitals very short, subtriangular, sides concave, width equal common suture. Inferior labials 9 (one less than other species); genials, the pairs short, equal. Gastrosteges 134, urosteges 35.

Color: above a bright dark olive, with fourteen blackish cross-bars contracted in the middle, as wide as their interspaces; the ground color appears in the middles of these bars, reducing them to skeletons. Sides of belly black, with irregular bright yellow spots, most distinct on the end of every other scutum. Top of head with ground like the back, and, like it, thickly covered with black specks. Sides of head and of muzzle black, speckled

* Two specimens of this species are in the museum of the Academy, presented by Drs. Gallar and Le Conte. Two other specimens, of unknown locality, are to be referred to the same.

with yellow, on the temple abruptly bounded above by the olive in a line to rictus. Labial plates with a yellow blotch in the middle. An indistinct brown band on each side the head from the occipitals backwards. Throat bright yellow, with black blotches behind, which continues on the anterior fourth the length. Belly brown, clouded yellow laterally, becoming blacker behind; tail yellow below.

Total length 22 in. 4 l.; of tail 3 in.; of gape 11 l.

This, the brightest species of the genus, was brought from Lake Jose Assu by the Thayer Expedition to Brazil, under direction of Professor Agassiz. M. C. Z. 362.

EUTÆNIA Bd. Gird.

EUTÆNIA PHENAX Cope, sp. nov.

This is a handsome and peculiar species, being the only one of the genus which is cross-banded.

Scales in nineteen rows. All keeled except the first. General form much as in *E. sirtalis*. Head rather short, muzzle obtuse, eye large, superciliary plates arched. Diameter of eye equal from same to rostral plate along the labials. Frontal shortened behind, with straight sides, .75 of parietal common suture. Parietals truncate behind. Upper labials eight, fourth and fifth in orbit. Loreal longer than high, one preocular, temporals 1—2. Inferior labials nine, sixth largest; genials equal. Urosteges 63; anal 1; gastrosteges 161.

Total length 23 in. 5 l.; of tail 5 in.; to rictus oris 9 lin.

Coloration. Above reddish-olive, crossed by thirty-six transverse spots, which are of a bright brownish-red, with a narrow black margin. They are separated by transverse intervals of only a scale in width, hence the black margins appear as paired cross-bars. These cross-bars extend to the first row of scales, and are as often continuous on the side as not. There is no lateral stripe, but there are black spots on the corner of the end of the gastrosteges. The margin of the first brown spot is in form of two black lines, diverging from the parietal plates backwards. There is a brown bar in front of frontal, one on the frontal and superciliaries behind (imperfect), and a longitudinal on each parietal. No pair of light parietal spots. Labials below eye with the last black-margined, otherwise light olive. Below, a strong green, unspotted.

This species is common near Cordova, Vera Cruz, whence Francis Sumichrast has sent specimens to the Smithsonian Inst. and Mus. A. N. S.

MASTICOPHIS Bd. Gird.

MASTICOPHIS MELANOLOMUS Cope, sp. nov.

A slender species, with one preopercular plate, and smooth scales in fifteen longitudinal series. Loreal an elongate parallelogram, not encroaching on the preocular. Postoculars two, the inferior very small. Superior labials nine, the fourth, fifth and sixth in orbit, seventh subtriangular, eighth and ninth longer than high. The last mentioned are separated from occipitals by two horizontal series of temporals, each of three plates, the anterior of the lower, and posterior of the upper, the longest, lower posterior widest. Occipitals broadly emarginate behind, their width in front equal the common suture and four-fifths frontal plate. Latter much narrowed; superciliaries broad, projecting. Internasals a little longer than broad, rostral just visible from above. Inferior labials ten, postgenials considerably longer than pregenials. A row of plates in an open chevron bounds the occipitals and temporals behind. Scales of body not narrowed; anal as in the genus, divided.

Gastrosteges 184; urosteges 128. Total length 44 in. 3 l.; of tail 14 in.; of rictus oris 1 in. 1 l.

Coloration grayish-olive, all the scales with a narrow black border, which become longitudinal lines on the posterior part of the length; one of these,

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on the line of the second and third rows of scales, extends throughout the posterior five-sixths the length. A dark shade through eye. Middle half of gastrosteges yellow.

From Yucatan; A. Schott, of the Comision Cientifica.

I had enumerated this as the *M. bilineatus* of Schlegel (Pr. A. N. S. 1866, 127), but an examination of Jan's beautiful figure enables me to correct the error.

LEPTOGNATHUS Dum. Bibr.

Günther, Jan.

A review of the species of this interesting genus has been already given. I give here references to all the species, and descriptions of some new ones not contained in the Williams College collection.

LEPTOGNATHUS BUCEPHALA Cope, Shaw, see Catalogue.

LEPTOGNATHUS VARIEGATUS Dum. Bibron, Erpet. Gen. vii, p. 477. *Dipsadomorus* Jan.

From Surinam. No specimen of this species has fallen under my observation.

LEPTOGNATHUS CATESBYI Günther, Weigel. See Catalogue.

LEPTOGNATHUS PAVONINA Dum. Bibr. Schlegel, Erpet. Gen. vii, 474. Guiana.

LEPTOGNATHUS ARTICULATA Cope, sp. nov. "*Dipsas brevis* Dum. Bibr.," Cope, Proc. A. N. Sci. Philada. 1860. Not of Dum. Bibr.

The most slender, compressed species of the genus. Muzzle very short; frontal plate hexagonal, sides converging, length equal width; occipitals broad and squarely truncate behind, not reached by the vertebral series of plates. Fourth and fifth superior labials entering orbit, sixth nearly excluded by the long lower postocular. Temporals two—three, with one inferior additional in contact with postocular. Sixth and seventh inferior labials connected by one transverse plate.

The brown annuli are wider anteriorly than posteriorly; the second covers $10\frac{1}{2}$ rows of scales, the seventeenth, just in front of the vent, $6\frac{1}{2}$. The yellow annuli are of nearly uniform width— $4\frac{1}{2}$ scales,—and without spots above or below. Top of head, sides, and upper labials in front of eye, all the lower labials, brown; rest of head with numerous short lines on the muzzle, yellow or white.

Gastrosteges 215; anal 1; urosteges 135. Total length 26.5 in.; of tail 8.75 in.; of gape 6 in.

From Veraguas, Costa Rica; sent to the Academy by R. W. Mitchell.

LEPTOGNATHUS MIKANII Günther, Schlegel. *Anholodon mikanii* Dum. Bibr. vii, 1165.

Eastern Brazil.

Body not elongate, but much compressed. Head less elevated, and with flatter muzzle than in the last.

Loreal square; frontal nearly equally hexagonal, with straight sides; occipitals elongate, rounded posteriorly. Third and fourth labials bounding orbits, the anterior little higher than long, posterior two much longer than high. Temporals 1 | 2, all longer than high, anterior in contact with both postoculars.

Dorsal cross-bands two scales wide, four scales apart, with zig-zag outlines from never crossing a scale. Posteriorly their extremities are broken off into a lateral series of spots. Belly with a series of elongate blotches on each side, which alternate with the lateral spots; dusted with brown medially. Top of head dark brown, with five darker light-edged spots; one on the junction of prefrontals with frontal, on one outer posterior angle of latter, and one on each occipital plate. Labial plates all reddish-brown margined.

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Gastrosteges 165; anal 1; urosteges 74. Total length 16 in.; of tail 3.75 in.; of gape 5 l.

From Bahia, Brazil. Spec. in Mus. Academy, presented by E. D. Cope.

LEPTOGNATHUS VAGA Jan., *Elenco Systematico* (nondescripta).

This species has not been described, so far as the writer is aware, but it can be assigned to its place in consequence of an examination of the original specimen, which was permitted the writer through the attention of Prof. Jan.

It belongs to group II, and has but two postocular plates; of its preoculars nothing can be said. Superior labials eight. There are four pairs of genials. General form less compressed than the types, with rather short body and tail. Above wood-brown, with indistinct cross series of spots. Below yellowish, tessellated with brown. Size not large for the genus.

This species is said to have been brought from Hong Kong, but this is altogether improbable; it is probably South American.

Another species, *L. incertus*, from Surinam, is named but not described by Jan, and is therefore likely to remain *incertus*.

LEPTOGNATHUS BREVIS Dum. Bibr., vii, 476.

This species is not described in sufficient detail to allow me to refer it to its place in this genus. It appears, however, to be different from any species here enumerated, though it has the coloration of several Mexican species.

Mexico, Dum. Bibron.

LEPTOGNATHUS OREAS Cope. See preceding Catalogue.

LEPTOGNATHUS INÆQUIFASCIATA Cope. *Cochliophagus inæqui*. Dum. Bibr., vii. From Brazil, with doubt. D. B.

LEPTOGNATHUS NEBULATA Günther, Linn. *Petalognathus* Dum. Bibr. *Coluber variegatus* Hallowell, Pr. A. N. S. ii, 214. See Catalogue.

LEPTOGNATHUS ANTHRACOPS Cope, sp. nov.

A strongly marked species, having a general resemblance to the *L. sartorii*.

Muzzle short, narrowed, frontal plate longer than wide, with straight sides; occipitals not shortened, broadly rounded behind. Anterior three labials narrow and high, fourth and fifth only touching orbit. Sixth upper labial much higher than long; seventh much longer than high. Inferior postocular larger than superior. Temporals rather small, subequal, 1 | 2 | 3; loreal longer than high. Sixth inferior labial enlarged. Second pair genials longer than wide, third pair wider than long.

Yellow annuli, $9\frac{1}{2}$ rows scales apart anteriorly, four rows distant posteriorly; yellow rings, wider behind. There are twenty-three on the body, twelve on the tail. They are often alternating on the belly, which is otherwise unspotted. No white markings on top of head.

Gastrosteges 177; anal 1; urosteges 76, some dozen or more at the tip of the tail undivided in the individual at hand.

Total length 19 in. 8 l.; of tail 5 in. 3 l.; of gape 4.75 l.

From Central America; one sp. in Mus. Academy from E. D. Cope, procured from the traveller and collector, Robert Bridges.

LEPTOGNATHUS BREVIFACIES Cope. *Tropidodipsas brevifacies* Cope, Proc. A. N. Sci. Philada. 1866.

From Yucatan.

LEPTOGNATHUS TURGIDA Cope, sp. nov. "*Cochliophagus inæquifasciatus* D. B.," Cope, Proc. A. N. Sci. Philada. 1862, 347; not of Dum. Bibr.

This species has the head very little distinct from the body when viewed from above, and the neck but little compressed. In profile the frontal region is seen to be concave, and the top of the muzzle swollen both longitudinally and transversely. The internasals are but little broader than long; the same

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may be said of the large prefrontals. Frontal hexagonal, scarcely longer than broad, with strongly convergent sides. Occipitals narrowed, emarginate behind. Temporals 1 | 2 | 2, the anterior not large, in contact with both post-oculars and fifth and sixth upper labials. Seventh labial bounded by two. The five anterior labials are higher than long, the two others a little longer than high, third and fourth entering orbit. Loreal longer than high. Eight inferior labials, fifth with greater transverse than longitudinal diameter.

Gastrosteges 159; anal 1; urosteges 41.

Color above a rich yellow-brown, with a series of black spots on the dorsal region, which are longer anteriorly, but separated by nearly equal spaces of 1.5 to 2 scales; length of third spot 7.5, scales of tenth, three scales. Behind the third spot the lateral portions are separated and sometimes divided, and extend to the ends of the scuta. Below nearly unspotted, except on tail. Gular region also immaculate. Head above thickly dusted with brown, paler on nape and top of muzzle. A pair of deep brown, yellow-edged spots on each occipital plate, converging behind; labials brown-dusted.

This is one of the most handsomely colored of the species, and of aberrant form.

From the Northern part of the Paraguay river.

LEPTOGNATHUS FASCIATA Cope. *Tropidodipsas fasciata* Günther, Catal. Snakes Brit. Mus., 1858.
From Mexico.

LEPTOGNATHUS SARTORII Cope. *Tropidodipsas* do. Cope, Proc. Acad. Nat. Sci. 1863, 100.
Vera Cruz, Mexico.

BATRACHIA.

PROSTHERAPIS INGUINALIS Cope, genus et species novæ Colostethidarum.

Char. gener.—Xiphisternum membranous (difficult to discover), manubrium a bony style, with cartilage disc; metatarsus slightly webbed, dilatations strong, each with two dermal scales on the upper side, separated by a fissure; terminal phalanges small, T-shaped; tongue cylindrical, free; no vomerine teeth; belly not areolate. Pupils longitudinal. Ethmoid well developed anteriorly, the prefrontals lateral, well separated.

This genus is interesting, as constituting the second of the little known family of the Colostethidae, which was established by the writer in 1867. Its general appearance is that of a Phyllobates, and it is related to Colostethus much as Limnocharis is to the first-named. The two leathery scales of the pallettes are peculiar, and resemble those of the under side in Phyllodactylus. The distal phalanges are short, and extend very little into the dilatation.

Char. specif.—Muzzle and canthus rostralis angulated, the former projecting, rounded, truncate from above; the loreal region nearly vertical. Nostril nearly terminal, eye large, its long diameter equal to near end of muzzle. Membrana tympani concealed. Skin everywhere smooth, a weak fold on the distal half the tarsus. Free portions of the metatarsi only webbed, all the toes with strong dermal margin; the fingers with a weaker one. Digital dilatations extended rather transversely; two metatarsal tubercles, both small, inner elongate. Inner nares almost lateral, ostia pharyngea small, half the size of the former.

Width head and jaws one-third length to end coccyx, and equal length head to opposite usual position of posterior margin tympanum. Heel to middle of orbit, wrist to beyond end muzzle.

	Lin.
Length head and body.....	12.5
“ fore limb.....	8
“ hind limb.....	18.5
“ foot without tarsus	5.6

Color dark brownish-lead, below dirty white. The almost black of the sides bounded below by an irregular pale border, below which are some dark marblings. The same border extends, with an axillary interruption, to the orbit, and continues on the upper lip as a series of light dots. A light band commences at the groin above, and extends to opposite the sacrum, converting the dark color of the side into a half-band. Femur and tibia dark, marbled before and behind.

From the river Truando, New Grenada. Brought by the expedition under Lieut. Michler, by Arthur Schott. This species and the *Dendrobates tinctorius* Wagl. were accidentally omitted from the report of this expedition, published in Proc. Acad. 1862, 355.

BUFO ARGILLACEUS Cope, sp. nov.

Ridges of cranium superciliary and supratympanic; no parietal branch. Parotoids elongate trigonal, the long angle prolonged towards the sides. Two weak metatarsal tubercles. A tarsal dermal fold; toes little webbed. Muzzle elongate, not much depressed or projecting beyond labial border. No preorbital ridge; superciliaries nearly parallel. Skin rather finely rugose.

Males olive-grey; females with a pale vertebral line, and a series of brown spots on each side of it. Crown, lips, and below unspotted. Length of head and body 2 in. 9 l.

This species is to be compared with the *B. granulatus* of Spix, which it represents in another region. It differs in lacking the preorbital ridge, and having a longer muzzle.

Numerous specimens in Museum Smithsonian from Colima, Western Mexico, from U. S. Consul, John Xantus.

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Second Supplement on some New Raniformia of the Old World.

TOMOPTERNA LABROSA Cope, sp. nov.

Head raniform, little elevated; end of muzzle recurved, loreal and suborbital regions concave, the edge of the maxillary region strongly projecting. From orbit to margin of jaw below it less than diameter of tympanum, two-thirds that of orbit. Tympanum elliptic, subvertical, about .66 long diameter eye fissure, latter .2 greater than from edge of same to external nostril, and 1.5 least interorbital width. Frontal and prefrontal regions slightly grooved medially. Vomerine teeth in two very short, nearly transverse, lines opposite the middle margin of the inner nares. Latter large, about equal to ostia pharyngea.

When the limbs are extended the carpus attains the end of the muzzle, and the heel the middle of the orbit. Tarsus equal third toe without last two phalanges. Cuneiform shovel small for the genus, equal inner toe less the last phalange. Webs large, measuring .66 the third and fifth toes. Thumb longer than second and fourth fingers. Skin of upper surfaces with numerous narrow irregular folds; eyelids slightly rugose behind. A strong fold above the tympanum decurved behind it.

	In.	Lin.		In.	Lin.
Total length head and body...	2	4.5	Length tarsus.....	6	
“ “ hind limb.....	3	4.5	“ foot.....	1	
Length tibia.....		.13	Width head behind.....	1	

Color above gray-olive, with paired blackish spots, on each side a light vertebral band. The anterior of these are a triangular blotch on top of muzzle and band across middle of each eyelid. Side of head blackish-gray with a pale gray band on end of muzzle, one from front of orbit to lip, and one below eye, longitudinally past lower edge tympanum bordered by blackish from orbit backwards. Femur with three, tibia with four, and outer edge foot with four blackish-gray cross-bars; femur pale-brown behind.

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This species is more slender in form than the others of the genus, and exhibits a fuller palmation of the feet; it does not differ more from the species of *Hoplobatrachus* Pet. than the *Ranae* do among themselves. One spec. (282) has the whole upper surface of the head, and a broad vertebral band yellow. Of the types are two specimens (No. 283) in Museum Comparative Zoology, Cambridge, all from Madagascar, presented to Prof. Agassiz by G. W. Goodhue.

TOMOPTERNA POROSA Cope, sp. nov.

Toes nearly completely webbed, 2.3 phalanges of the fourth toe free. Muzzle obtuse ovate from above, decurved in profile, as long as diameter of eyeslit. Top of front and muzzle plane, canthus distinct, contracted, obtuse loreal region with a longitudinal concavity. Tympanum round, nearly as large as eye, distinct. From orbit to maxillary border .66 diameter tympanum; lip rather prominent below orbit. Vomerine teeth in two fasciculi opposite middle or hind margin of choanae, nearer each other than margin. Choanae smaller than the large ostia.

Fingers with very small web at base, thumb longer than second, equal fourth. Tarsus of extended limb beyond end muzzle; heel to front of orbit. Tarsus 2.3 times in longest toe. Cuneiform shovel 2.66 times in tarsus.

	In.	Lin.		In.	Lin.
Length head and body	2	1.75	Length head to tympanum		
Hind limb	3	3.75	behind.....	8.25	
Tibia.....		.11	Width head same point.....	9.	
Hind foot.....	1	.7			

A glandular dermal fold from above tympanum to above groin on each side; the greater part of the eyelid glandular and covered with pores. A glandular fold from angle mouth to behind above axilla. No tarsal folds.

Color above brown, with dark-gray shades; in one specimen an imperfect pale-gray vertebral line. Under surfaces white, sides coarsely and handsomely marbled with brown and white below and gray above. Head dark-brown, a pale line on the lip, a slight margin to lower lip. Femur brown with pale marblings.

This species is abundantly different from those hitherto known, and seems to indicate that the genus *Hoplobatrachus* Peters is less distinct from *Tomopterna* than hitherto supposed.

Three specimens (No. 305), Agassiz' Mus. Compar. Zoology, Cambridge, Mass. From Kanagawa, Japan. From Dr. Jas. T. Gulick.

HYLORANA LEPTOGLOSSA Cope, sp. nov.

This species is most nearly allied to the *H. temporalis* Günther of Ceylon. The points of difference are *italicised* in the following description:

Hind limbs as in *H. temporalis*, and the fourth toe is only .33 longer than the third and fifth. Two well marked metatarsal tubercles. Vomerine teeth in two very short oblique rows commencing opposite the posterior margins of the choanae and directed backwards; they are about as far from each other as from choanae. *Tongue narrow, not filling rami of jaws.* Tympanum as large as eye; *latter contained 1.5 times in length of muzzle, extending beyond nostril.* A heavy glandular dorsolateral fold, *separated by a groove from another interrupted one below it.* A deep groove from axilla to near groin. *A short glandular fold from angle of mouth.* Muzzle flattened acuminate at the end. Heel of hind limb to front of orbit. Fourth toe more than half length head and body; *no dermal fold on upper edge of tarsus.*

Above olivaceous, with a blackish band from end muzzle to groin, margined with yellow below, from below eye to axilla. Pale yellow below, sides blackish spotted. Femora behind black, yellow veined. Limbs paler, rather closely cross-barred.

	Lin.		Lin.
Length head and body.....	21.5	Width head behind tympanum..	7.75
" hind limb	20.	Length hind foot	14.5

1868.]

Three specimens (623) in Mus. Compar. Zoology, Cambridge, Mass. From near Rangoon, Burmah. With many other valuable specimens, these were procured by Wm. Theobald, Jr.

HYLORANA SUBCERULEA Cope, sp. nov.

Fourth toe somewhat more than half the length of the head and body. Two lateral glandular folds, the inferior much narrower, not reaching groin from angle mouth. No groove on the side of the belly. General form slender, the head elongate, the muzzle produced, 1.5 length of eye fissure, the nostril measuring two-fifths this distance. Tympanum .66 the diameter of eye. Interorbital width equal from eye to nostril. The middle of the metacarpus measures the end of the muzzle, as does the proximal two-fifths the tarsus. Skin above smooth except on posterior iliac region, where are small warts. Sides scarcely glandular. A delicate fold on tarsus; one metatarsal tubercle. Tongue rhombic, filling space between rami, contracted a little behind. Vomerine teeth in two rather long series originating at the front of the choanae, and extend very obliquely backwards, and well separated. 1.3 phalanges of third and fifth toes free, and three phalanges of fourth toe.

Above glossy blue, sides with a blackish-blue band from end muzzle to groin. Dermal folds and a band all around the upper lip brassy yellow. Femora behind speckled and marbled with yellow on a blackish ground, and with a dark longitudinal band below; upper face tibia golden brown, not cross-barred. Arm not crossed-barred. Everywhere below brown shaded, palest on the belly. In a younger specimen the belly is white and the upper surfaces pale brown.

	Lin.		Lin.
Length head and body.....	15.1	Length hind limb.....	2.8
“ tibia.....	8.	“ to behind tympanum...	6.
“ tarsus.....	4.5	Width at same point.....	4.5
“ foot.....	8.25		

This very handsome animal is nearest in general characters to the *H. macrodactyla* Günther, a specimen of which was procured at the same locality, viz.: Rangoon, Burmah, by Wm. Theobald, Jr., above recorded. Its feet are much less palmate than those of the *H. chalconota*, from Java, which it also resembles. It is one of the best illustrations of a genus which has been particularly furnished among the Batrachia with beauty of hue and lustre. Mus. Compar. Zoology (624—626), three specimens.

Sexual Law in *ACER DASYCARPUM* Ehrh.

BY THOMAS MEEHAN.

Noticing among the silver maple trees at Bristol, Pa., some trees which had evidently borne only pistillate flowers for many years, and had subsequently pushed forth branches which bore only male flowers, it occurred to me that possibly extended observations might enable me to discover the law which governed the production of male or female forms respectively. Afterwards examined carefully some thousands of trees in blossom, and though I failed in the immediate object, the discovery of the law, it may serve an useful purpose to place on record the facts observed in the investigation.

The staminate flowers are easily distinguished from the pistillate ones, not only by their larger size, owing to the development of the stamens, but by the pale yellowish-green of the filaments. The awl-shaped styles of the female flowers do not project far beyond the scales, and are reddish-brown. The Bristol trees were about a foot in diameter, very healthy, judging by their clean smooth bark, and had probably been in fruit-bearing condition for at least ten years. The proportion of male to female trees was about equal. There were many instances of branches with male flowers which had perhaps

[March,